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THE PASSING OF A GREAT LEADER

COLONEL SAMUEL POMEROY COLT, whose untimely decease is chronicled in this issue, will go down in history as one of America's great industrial leaders. It was his vision, determination and management that transformed the United States Rubber Company from a promoters' plaything, debt-ridden and tottering, into a prosperous $150,000,000 corporation, amply financed, with modern equipment, high-class products and splendid executive personnel. To accomplish this the ability to deal successfully with strong men of varying types, temperaments and ambitions was an absolute necessity. This Colonel Colt possessed to a remarkable degree. To unify such potent and individual human factors as Joseph Banigan, E. S. Converse, J. D. Vermeule, F. M. Shepard, Charles R. Flint, L. K. McClymonds, R. D. Evans, George H. Hood, Charles H. Dale, the Fords, and many others, required great diplomacy, vast knowledge of men and endless patience. They were all pioneers, creators of big business along lines of their own, and were possessed by a deep-rooted antipathy to control, as well as an old-fashioned suspicion of competitors. Their factories, located in widely separated states, were run under widely differing conditions, with their own compounds, products and selling methods. With all of these varied problems—financial, mechanical and human—Colonel Colt grappled and successfully solved them.

Pleasantly aggressive, far-sighted, tireless, he labored to build always bigger, better, stronger. As to his triumphs in other fields, as in the creation of the great Industrial Trust Company of Providence, they do not enter into the field of rubber, but are cited merely to show the business and creative ability possessed by this leader of men. In his passing, industrial circles lose a most notable figure, and the rubber trade its best-known member.

SHORTAGE OF COTTON IMMINENT

COMING at a juncture when there is urgent need for revision downward in cost production and selling price in order to stimulate sluggish trade into reasonable activity, comes official confirmation of the report that, despite favorable midsummer growing conditions, the United States cotton crop will scarcely total 8,500,000 bales, or some 5,000,000 less than last year, and almost 8,000,000 less than the record crop of 1914. Nor does it seem at all probable that the figure named will be raised when the crop is marketed, or that the average price for spot cotton will work in any direction other than away from the June, 1921, low of 10.85 cents a pound, as compared with 43.75 cents in June, 1920. The carry-over is not considerable in view of the potential demand. American cotton acreage has been reduced between 25 and 30 per cent, and needy Europe, largely through credits allowed to idle mill owners, is absorbing much of the restricted cotton production of the Nile Valley and elsewhere in the Old World. All these are factors tending to make cotton dearer and to add to the cost of rubber goods containing that staple.

An immense amount of cotton is used in the various branches of the rubber industry, and the needs of the latter are certainly not growing less; yet it is doubtful if even a fair allowance has been made for the requirements of the industry by its leaders. Many buyers have sensed to a degree the demands that will be made and have made fair provision, but it is feared that too many manufacturers of rubber goods have not materially anticipated the demands that will be made on them. In other words, they have not stocked up to the extent that trade in the near future would appear to justify. Even prudent purchasers may hold out too long in the hope of seeing still lower cotton prices, unmindful of the fact that present-day conditions may not be judged by criteria of the past, and that influences are working inexorably toward hardening rather than softening of cotton prices.

A resumption of activity is noted among the textile manufacturers, but the demand comes largely from merchants rather than from the tire, proofing, footwear, and other branches of the rubber trade. With dearer cotton in prospect and little likelihood of reduction in labor cost, the prospect favors an upward trend in the price of textiles. Certainly it seems that the rubber manufacturer who looks far enough ahead in contracting for woven material will have an advantage over him who has overstayed his time in bargain-hunting. He may have to ask

a little more later on for his finished goods than present prices, but still he will be able to quote closer figures than his competitor who bought at the eleventh hour on a rising market.

HIGHER RUBBER AND SOON?

THAT the price of crude rubber will continue at its present low figure is hardly a possibility. To be sure, the rule has been that however one guessed as to the future trend of prices in this commodity the guess was usually wrong. Nevertheless, low rubber has always in time been succeeded by high rubber. The three-dollar level of a few years ago in the light of future needs looked fairly permanent, but such was not the case. High tides recede and "low water" in time is succeeded by high. If for no other reason the forced cessation of tapping on the part of so many planters will bring the supply down and the price up. Those who are able to hold on will profit, those who do not will lose. It is a great pity that planters in the Far East who so ably came forward and supplied the rubber so vital to industry should suffer and perhaps lose all. It would also be unfortunate if some great monopoly gathered in the bulk of the far eastern plantations. In all probability nothing of the kind will occur. The advance of a few cents a pound would clear the skies, and that is sure with the world's manufacturers soon coming into the market for rubber, and lots of it.

THE NATION'S HIGHWAYS

APART from the production of rubber tires and his interest in the vehicles using them, there is scarcely anything with which a tire manufacturer might more properly concern himself than the roads on which his product plays such an important part in transporting men and materials. Readily does he sympathize with all endeavors for the betterment and extension of the country's roads, but too often he allows his affairs to so engross his time that he scarcely notices the laudable efforts of those working for the benefit of the whole community, and much less does he give them a word of direct encouragement. He quite appreciates the great advantages accruing to the nation from ample, well-made, properly maintained highways. He knows that their early construction would hasten the return of normalcy and add wonderfully to the comfort, well-being, and convenience of millions. He doubtless realizes that national and state governments have appropriated approximately a billion dollars for making new or overhauling old arteries of travel, yet unthinkingly he leaves largely to venal or careless politicians the matter of deciding how such an immense fund shall be expended.

It is begging the question to say that the politicians will have the determining voice, no matter what good counsel is offered them, and that they will only too often serve special interests rather than work for the common benefit. But they can be influenced for good as well as for ill. They can be shown the advantage of rendering conspicuous public service, of doing something that is of lasting credit to them, and which would largely atone for remissness in other directions.

It is in this connection that such a body as the Advisory Board on Highway Research of the National Research Council can be very helpful. Its disinterestedness, its great accumulation of valuable data, and its readiness to aid in solving present-day problems in highway making, maintenance, and financing, as well as the use and restriction of vehicles and the question of transportation from every angle, must appeal even to the politician of ordinary stamp.

An organization such as this, which has the active cooperation of the Engineering Foundation, army and automotive engineers, national and state highway departments, and leading technical societies and educational institutions, certainly merits the lively interest, not of tire manufacturers alone, but of all rubber men who would, while promoting their own welfare, do an immense amount of good for their fellow countrymen.

THE STRAIGHT-SIDE WINNING

IN spite of European conservatism and dread of change, the straight-side tire is steadily proving its superiority over the clincher. The conversion of the Dunlop Rubber Co., Limited, to straight-side superiority will have an enormous effect. The great French, Italian and German tire companies will be forced into line to keep their business. To a degree it is the story of the rubber-cored golf ball translated into terms of tires.

ONE OF THE BEST RECOMMENDATIONS MADE BY THE American delegates at the session of the International Chamber of Commerce in London was for the appointment of a permanent International Committee to adjust difficulties in the exchange of goods between nationals of different countries. Nor could a better agency be selected for the elimination of unnecessary friction, often due to mere misunderstanding, in the conduct of individual transactions in international trade. A comprehensive plan is provided for rectifying, simplifying and expediting negotiations; and not the least important reforms proposed are those for establishing a council of arbitration to save delay and expense in litigation, the interchange of accurate credit information, equal opportunities for business, the lessening of artificial trade restrictions, the accurate national branding of merchandise, and measures to stamp out trade mark, patent, and copyright piracy.

THE RUBBER TENT USED SO SUCCESSFULLY IN GAS FUMIgation had but one rival, a scale-eating bug known as *Pediculoides*. The past tense is used advisedly, for the "Peds," once the scale is destroyed, turn ravenously upon human beings and have already put many in hospitals. The bug is therefore to be exterminated, if that can be done, and the tent comes into its own again.

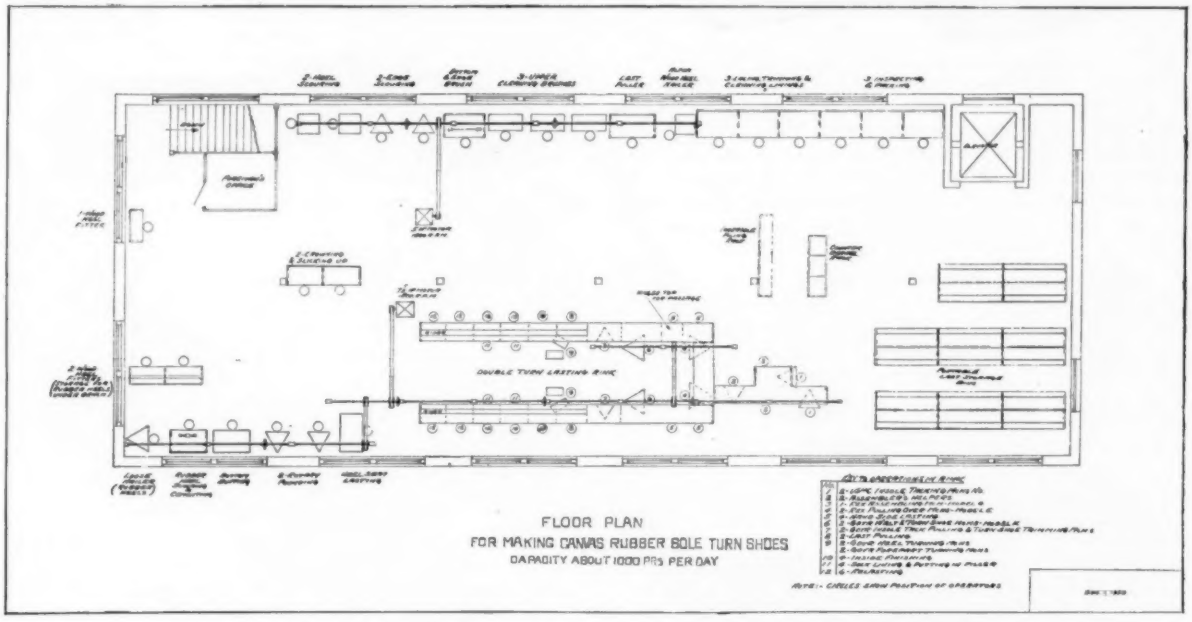
The Rubber Sole Turn Shoe Perfected[1]

A New and Important Development

A NEW type of footwear which, in the opinion of those who have tested it from the standpoint of both the wearer and manufacturer, and which is destined to be a factor of no small consequence in the shoe trade of the immediate future, is the Goodyear rubber sole turn shoe.

POSSIBILITIES OF THE PROCESS

This new development is the direct outcome of the great effort made to conserve materials and improve methods which came during the war, and to provide, as well, a more practical construction for the manufacture of canvas rubber shoes. The



TYPICAL FACTORY PLAN SHOWING ARRANGEMENT OF MACHINES AND OPERATIONS

GOODYEAR TURN SOLE RINK SHOWING TRIMMING MACHINE, GOODYEAR HEEL TURNING AND FOREPART TURNING MACHINES, AND RELASTERS

[1] The information and illustrations used in this article were obtained from the United Shoe Machinery Corporation, Boston, Massachusetts.

process is by no means confined to manufacturers of rubber footwear, but presents advantages which should appeal very strongly to all makers of shoes in which rubber has a place.

A NEW TYPE OF SHOE

The new type of footwear embodies to an extent hitherto unknown in the rubber shoe trade the three desirable and important features of a good shoe—style, comfort and durability. Vulcanization other than in the preparation of the sole is entirely eliminated, and, as the method of manufacturing and the equipment used is exactly that employed in making high-grade and comfortable leather turn shoes so much in demand at the present time, the possibilities which the new process brings to the producer of fabric shoes are only just now being realized.

GOODYEAR TURN SOLE WITHOUT HEEL

BASIC FEATURES

The basis upon which the whole success of the new method is built is the construction of a turned shoe sole of the so-called "fiber compound" or "composition rubber," which is molded with a rib or shoulder and strongly reinforced to withhold the strain of the sewing. A fabric pocket is provided for a steel shank piece, which is inserted at the proper time to give permanent form to the arch of the shoe. This method of preparing the turn sole has been developed to the point where it has met every requirement and stood every test that has been placed upon it. It is made by the use of a special and ingenious set of molds which have been perfected and can be obtained by those manufacturing this type of shoe.

BEGINNING OF THE PROCESS, INSOLE TACKING AND ASSEMBLING MACHINES

THE RUBBER TURN SOLE

The sole is molded with or without a heel and, as will be seen by the accompanying illustrations, is of such construction that, with the inserted sock lining or slip sole in the completed shoe, it does not in any way interfere with the comfort of the wearer.

In the preparation of this turned sole, several operations are combined. The making of the heel as an integral part of the sole does away with all of the operations necessary in completing this part of the shoe, and the forepart carries the separations or indentations which usually appear on the upper surface of a leather turn or welt shoe.

TYPICAL FACTORY PLAN

The system of machinery used at the present time has been so thoroughly organized that the work passes with the greatest rapidity from one operation to another up to the point of completion. The accompanying detailed plan shows the arrangement of the various machines required in the making of this shoe and the organization of the work, which has been the outcome of long study and experiments.

PULLING AND LASTING

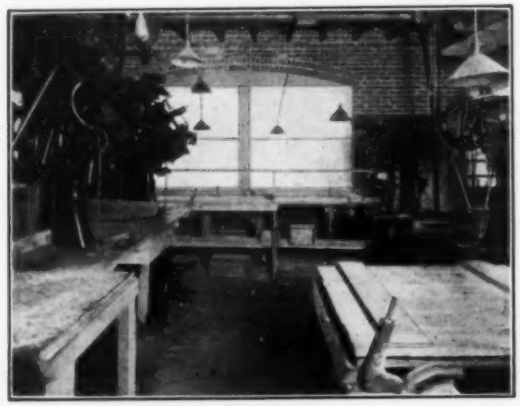
The shoe upper is prepared in the regular way, the molded sole being fastened on the last by machinery. Where the heel is an integral part of the sole a recess last is used for first lasting only. The fitted upper and the molded sole are assembled together on the lasts by means of the Rex assembling machine,

GOODYEAR TURN SOLE WITH HEEL

after which it then passes to the pulling-over machine, at which point the shoe is pulled in the regular way by driving nine tacks, so distributed that the complete toe and forepart of the shoe is thoroughly pulled and lasted. In making shoes with sewed seats, after placing a few anchor tacks in the side, further lasting is unnecessary, as the operation of the Goodyear turn sewing machine, which immediately follows the pulling and lasting, draws the shoe upper securely and smoothly to the last at all points. In instances where a superior type of shoe is made and a nail seat is desired, the heel-seat lasting machine may be used.

UPPER SEWING AND HEEL TURNING

After the pulling and lasting operations mentioned above, the shoe is ready for the Goodyear turn sewing machine and the upper is fastened to the sole in the same manner that it is in factories where this fine class of leather footwear is made. The upper is then trimmed and the last is withdrawn, and the shoe goes to the Goodyear heel turning machine, which is a recently perfected one. The turning operation on the heel heretofore has required exceptional skill and long training on the part of the operatives. This machine is now very successful in its work and operators very readily become accustomed to it.



PULLING-OVER MACHINE AND GOODYEAR TURN SHOE SEWING MACHINE

TURNING THE FOREPART

After turning the heel, the forepart is turned by a Goodyear forepart turning machine, which is also a new machine, invented for this purpose, and does its work with a rapidity and

accuracy which has been long sought for in making this type of shoe, for the number of operators experienced and skilled in this operation has been extremely small and the demand for them has been very great. As with the heel-turning machine, the operation of this machine is rapidly learned by operators who become very skilful in doing this wonderful and essential part in making a turn shoe.

After the shoe has been partially turned, or to that point where the shank no longer is disturbed, the steel shank piece intended to give permanent form to the shank of the shoe is inserted in a pocket which holds it permanently in place and gives definite form to the shank.

RELASTING, TRIMMING AND FINISHING

With the completion of the turning operation, the shoe is again relasted by hand lasters who place within it a smaller last and straighten the linings so that the shoe is ready for the operation of trimming forepart and heel and the subsequent insertion of the sock liner or filler. The necessary finishing operations are observed in making a marketable shoe of the character and type for which there has been an active demand in the last two years.

The finished shoe is of such flexibility and comfort that the demand for it, in the opinion of those who are familiar with what has been accomplished in perfecting this system of manufacture, is destined to increase rapidly when the public becomes familiar with the desirable qualities which the shoe possesses. It can safely be said that no recent development in shoemaking is of greater importance, particularly to concerns that have heretofore confined their shoe manufacturing to those methods which required the use of vulcanization. It will well repay any manufacturer of fabric shoes to thoroughly investigate this process. The four types of shoes shown in the accompanying illustrations are examples of what can be achieved by the Goodyear turn-sole system.

HIGH-CUT BOOT FOR WOMEN

MEN'S SPRING-HEEL OXFORD

WOMEN'S OXFORD

MEN'S SPORT OXFORD

FINISHED PRODUCTS OF THE GOODYEAR TURN SOLE SYSTEM, MADE FOR STYLE, COMFORT AND DURABILITY

HOW TO REMOVE PNEUMATIC TRUCK TIRES

The United States Tire Co., New York, N. Y., pioneer builder of truck pneumatics, points out briefly how handling a change of tires on the road can be made a one-man job.

To dismount the tire and rim from the wheel, jack up the car, loosen the tire bolts and then the rim by shock, and turn the wheel so that the sector containing the valve is near the ground. Grasp the tire with both hands at points just below the hub level, and lift the rim away from the top of the wheel, watching the valve to make sure that it does not bind in the felloe when the rim slides off the felloe band. This method of dismounting the tire and rim from the wheel requires very little lifting, and does no damage to valve or tube.

To detach the tire from the rim lay the tire on level ground, locking-ring side up, remove the valve plunger to complete deflation, and push back the valve stem inside the rim. Remove locking and side rings, loosen flap all around and lift tire straight up off the rim. Reverse the operations when the tire is ready for replacement on the rim.

In applying the rim and tire to the wheel engage the valve stem in the felloe at a point level with the hub, push the rim firmly against the felloe and turn the wheel until the valve is at the highest possible point. The rim will drop into place on the felloe. This knack of first engaging the valve, then turning the tire and rim on the wheel eliminates all direct lifting, and makes the applying of even an eight-inch tire a comparatively simple matter.

WHY BURIED CABLES HEAT

British electrical engineers have been trying to find a way to lessen the tendency of buried cables to deteriorate through heating, and through the same cause to suffer a loss in conductivity. At a recent conference in Liverpool experts reporting the results of various tests showed that paper-covered wires, unlike those insulated in rubber or gutta percha, were subject to considerable variations in longitudinal expansion. A rise from the "normal" earth temperature of 60 degrees F. to 120 degrees in a 220-yard strand of armored copper cable caused an expansion of 4½ inches, distorting the inelastic lead covering and occasioning much trouble. Over 120 degrees the dielectric loss rose rapidly, or, in other words, the efficiency of the insulating medium decreases proportionally to the increase in heat. Many factors, it was pointed out, favored the rise in the temperature of the copper conductor and lessened its current-carrying capacity, such as a considerable increase in voltage, a very dry or loose soil, and particularly trapping of air in minute films between the paper coating and the copper, or differing degrees of intimacy of contact between the dielectric and the conductor.

A Glossary of Words and Terms Used in the Rubber Industry—VII[1]

By Henry C. Pearson

Pneumatic Tire Definitions[2]

THE following definitions relating to pneumatic tires are presented subject to additions and corrections. They are purposely brief, the plan being ultimately to expand those of major, and delete those of minor importance. Factory terms, machines and processes have, in this section, been excluded except when they explain finished products.

PNEUMATIC TIRE. A circular rubber and fabric tube for attachment to the rim of a wheel, inflatable with air or gas under pressure, usually through an affixed valve. The fabric supplies strength and checks undue expansion. The rubber binds the plies of fabric together, insulates threads or cords that they may not chafe, protects from moisture and abrasion, presents a surface adapted for traction, resistant to side slip, and confines the air. Pneumatic tires are called in French, "pneumatiques," in English, "pneumatic tyres," and in almost all other languages, "pneumatics," sometimes, "pneus."

There are two general types, double tube and single tube. The double tube consists of two separate parts, the casing and the inner tube. The casing is a concave band of rubber and fabric, open throughout its whole inner circumference and nearly horseshoe-shaped in cross-section. Its parts in general are: rubber tread, rubberized fabric breaker strip, carcass built of plies of rubberized building fabric, or of cords or cord fabric, side-walls, and rim attachment beads of rubber and fabric or rubber fabric and wire. Its office is to envelop, retain, and protect the inner tube and afford a suitable surface for road contact.

Three types of casings are used, fabric, cord and cord fabric. The fabric type is built up of plies of frictioned square-woven fabric so applied that warp and woof threads lie diagonal to the circumference of the tire. Cord tire casings are made of separate cords, rubber impregnated, laid diagonally in two or more separate plies, each cord and each ply separated, cushioned and isolated by coatings or layers of rubber. Cord fabric tire casings are made of cord layers (plies) which consist of close-lying parallel warp cords lightly held together with tie-in-threads, rubber impregnated and insulated. They are ordinarily made of 6, 8, or more plies, the cords of each lying diagonal to the circumference and also to the other plies in alternation.

The inner tube is usually a circular, endless, elastic tube of rubber to which an inflation valve is affixed, or a straight tube sealed at the ends which butt together when it is fitted within the circular casing. Its office is to hold air under pressure, being enveloped and protected by the casing into which it fits. The single-tube tire used chiefly on American bicycles is an endless tube of rubber and fabric brought by pressure and vulcanization into a homogeneous unit. It consists of rubber lining, frictioned fabric plies, rubber cover tread and valve.

The pneumatic tire is used on passenger automobiles, motorcycles, motor trucks, airplanes and bicycles, and to a lesser degree on racing sulkies, carriages, perambulators and jinrickishas.

ABRASION. The wearing away of the surface of a tire by rubbing off or attrition, as tread abrasion.

ABSORBABILITY. A quality possessed in a marked degree by pneumatic tires, whereby they resist compressive shocks, or take up and disperse through the resilient casing and the elastic, inflated inner tube, the jarring or concussion due to the striking of or passing over minor obstructions of the road, with minimum vibration and loss of energy.

ACCELERATED CURE. See Vulcanization.

ACCESSIBLE VALVES. Inner tube valves within easy reach, in contradistinction to valves set on the inner side of a wheel, as on types of disk wheels which by reason of their inaccessibility make frequent pressure testing difficult and tend to the neglect of proper inflation.

ACCESSORY KIT. A trade term for an assortment of rubberized fabric and rubber patches, cement, etc., for emergency work in tire repair. See Repair.

ACID. A shop term applied to cold-cure solutions containing chloride of sulphur. See Cold Cure.

ACID CURE CEMENT. A cold cure, self-vulcanizing cement used in splicing inner tubes, affixing valve patches, and other repair work; a typical formula being 1.7 fluid ounces of sulphur monochloride to 1 gallon of carbon tetrachloride mixed with pure rubber. See Cement.

ADHESION. The friction strength of union between the component parts and the materials in a casing. See Specifications.

ADJUSTER. One who adjusts. See Adjustment.

ADJUSTMENT. A refund or allowance to the buyer of a tire claimed to have failed to give satisfaction through defect in material or workmanship. See Guaranty.

AERIAL WHEEL. A name given to the first pneumatic vehicle tire patented in England in 1845 by Robert W. Thompson.

AFTERCURE. A slow process of spontaneous vulcanization in normal atmospheric temperature, remarked in the aging of rubber when it becomes inelastic and inclines to chip and check on its surface.

AGING QUALITIES. Properties possessed by a tire, involving materials and make-up, which determine the duration of its normal service. Often applied to side-wall stock. See Life.

AIR CURE CEMENT. India rubber in a volatile solvent so compounded that it cures on exposure to the air; self curing cement. See Acid Cure Cement.

AIR GAGE, OR GAUGE. A small instrument applied to a valve for determining the pressure of air in an inflated inner tube, and usually self-recording. See Pressure Gage.

AIR NIPPLES. Rubber devices attached to tires in which valves are fastened.

AIR PRESSURE. The expansive stress of the air in pneumatic tires proportioned to tire size and maximum load. See Load.

AIR RELEASER. A contrivance for screwing upon a valve which, by depressing the plunger pin or check, allows an inner tube to deflate, as for repair. See Deflator.

AIR SUBSTITUTES. Various devices and materials designed to supplant compressed air for resilience in pneumatic tires. See Fillers.

AIR TUBE. A British term for inner tube.

AIR TUBE PROTECTOR. An interliner of several plies of friction fabric molded to fit inside a casing and having beveled or feathered edges. Designed to protect the inner tube when a casing has been pierced. It is placed over the inner tube and inserted with the latter but not cemented to the casing. See Reliners.

AIR VALVE. The channel through which compressed air is supplied to or expelled from an inner tube. See Valve.

AIRPLANE TIRE (Aeroplane Tire). A light cord or fabric tire, for airplanes. First manufactured as a single-tube tire, then as a clincher fabric tire, and finally as a clincher cord tire. At present the Palmer type of clincher cord airplane tire with a wire reinforcement in the bead is generally used. This allows a smaller bead to be used and lightens the tire, and also allows

[1] Continued from THE INDIA RUBBER WORLD, July 1, 1921, pages 723-725.

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tires of the clincher type to be used up to 200 millimeters section diameter. See Specifications and Sizes.

ALARMS. Various attachments on inner tube valves for indicating automatically by whistling, bell striking, cap explosion, clicking, bumping, or concussion, deflation of a tube below a predetermined minimum of pressure.

ALINEMENT. Paralleling of motor-car wheels to avoid uneven wear of tires.

ALL RUBBER PATCH STOCK. A strong, cured stock used in repair, having a layer of uncured gum. See Patches.

ALL WARP TIRE FABRIC. A material for a tire carcass invented by John Fullerton Palmer, an American, and brought out in 1893 in the United States and Great Britain. It consists wholly of warp (lengthwise) threads with no weft (crosswise) threads, calendered on sheet rubber, then cut into strips wound spirally on a mandrel, and overlaid with similar strips in reverse direction.

ANTI-RUST STRIP. A British term for a circular flap of rough rubber sheet fitted to the bed of an inner tube used with a clincher type tire, and designed to protect the tube from a rusty rim.

ARMOR. A modified form of chain protection for a casing employing, in one type, numerous bands 2 inches wide, of flat steel links ⅛-inch thick hooked together, and which may be hooked to a rim or put on like a tire. Often used like a boot, in one or more bands, to protect a casing damaged by a blow-out or rim cut.

ARMORED TIRE. A so-called puncture proof tire having leather or rubber treads in which wire, chain, metal bands or disks are embedded, or to which they are attached, to reinforce the casing. See Treads.

ASSOCIATION GUARANTY. A standard form of guaranty, adopted in 1896 by the Rubber Tire Association, comprising leading bicycle tire manufacturers in the United States, to correct many troubles caused by vague and difficult guaranties and the demands on manufacturers for replacements. Revised, and restrictions added, in 1898.

AUTO TREAD STOCK. A reclaimer's term for a carcass comprising tread and three or four outer plies.

AUTOMOBILE TIRE. A pneumatic, solid, cushion or spring tire used upon self-propelled passenger vehicles. See Specifications and Sizes.

AXLE LOAD. The weight of an automobile and its contents upborne by the axles as set in the wheel hubs; a factor determining—with the tire size—the proper pressure to be carried in a tire, the load-weight being calculated by weighing the front and rear of the leveled, fully loaded car separately and dividing by two, reference to the inflation scale then giving the correct air pressure. See Load.

BABY CAB PNEUMATIC. An inflatable single-tube tire for perambulators, and somewhat smaller than a bicycle tire.

BAILEY TREAD. The first practical rubber non-skid tread using small rubber studs or buttons. Named after the inventor.

BALANCE. A manufacturer's term referring to a harmonious combination of quality of material, quantity proportion, workmanship, and vulcanization, with a perfect working together of carcass, tread and bead.

BALLOON TIRE. A slighting term applied in the early nineties to pneumatic bicycle tires which, unlike the solids, had to be blown up like a balloon.

BANDAGE WRAPPING. An operation whereby a strip of cloth is dampened and wound spirally about a built-up tire and its core—usually in three layers—before the tire is put in the vulcanizer. See Single Cure.

BANDAGE WRAPPING FABRIC. A light-woven cotton sheeting used for winding around built-up casings or inner tubes in the open-cure process.

BAREBACK. A fabric frictioned on one side only and used in repair work.

BARTLETT TIRE. The original clincher tire patented in Great Britain in 1889 by William Erskine Bartlett. See Clincher.

BASIC MATERIALS. Fundamentals used in tire manufacture, india rubber, cotton, compounding ingredients, and solvents. See India rubber, Cotton, Ingredients, Solvents.

BEAD. The thickened, stiffened edges of a tire casing by which it is fastened to a wheel rim, made usually with semi-hard rubber cores for clincher tires, or with rubber-embedded steel piano wire, or braided spring steel ribbon for quick detachable and straight side tires. The parts of a bead are: core, cover, toe and heel.

The varieties of beads suitable for different patterns of rims include: clincher, in which the extensible inner edges of the casing are made to spring over and hook under the incurved edges of the rim by means of a shoulder on the outer side of the casing edge, the bead core being usually of semi-hard rubber; straight-side, in which the outer edges of the beads are flattened and at right angles to the base of the bead, in which strands of wire or braided wire embedded in rubber form an inextensible core, the casing being adapted to quick detachable and quick demountable rims on which a removable outer flange allows ready removal or application of a casing: combination bead, a straight-side bead with a quick detachable filler shoulder of hard rubber attached to make a straight-side tire adaptable to a clincher rim.

BEAD COVER. A light, frictioned fabric lapped over a bead from toe to side wall. See Chafing Strip.

BEAD FABRIC. See Chafing Strip.

BEAD HEEL. The outside edge of the bead. See Bead.

BEAD-LOCK INNER TIRE. An interliner consisting of four or five plies of frictioned fabric molded to fit over the inner tube with one ply of the fabric forming flaps at either side to fit over the beads and be locked between the tire beads and the wheel rims. See Reliner.

BEAD SECTION. Insertion of new section where a bead has been broken. A repair term.

BEAD TIE-IN. An operation in tire construction, in which, after the several plies of fabric have been stretched on the core, all plies—in clincher casings—are trimmed at the toe of the bead. In wire-bead casings the plies are alternately folded across the base of the bead and trimmed. A cover of rubber about 1/16-inch thick and of compound similar to that used on the fabric is then applied over all.

BEAD TOE. The point of the bead nearest the tube. See Bead.

BEADED-EDGE RIM. A British term for a clincher type rim. See Rims.

BEADED-EDGE TYRE. A British term for a casing of the clincher type. See Clincher.

BEADING. The application of a bead strip to the base of a tire carcass and the overlapping of it with gum or fabric, or the removal of tire beads—a reclaimer's term.

BEADLESS TIRES. Discarded tires lacking beads but not stripped. A reclaimer's term.

BEADS, SEMI-HARD. Term applied to a special rubber compound forming the bead core of many of the smaller automobile tires and most motorcycle tires of the clincher type. The cores afford enough stretch to permit the finished tires to be easily pulled off a one-piece vulcanizing core mold as well as to be readily sprung on a clincher rim.

BIAS FABRIC. A square-woven frictioned fabric cut into bias strips. A rubber manufacturer's term.

BIAS-WOVEN FABRIC. A non-raveling fabric, the warp threads of which, in weaving, remain in the usual lengthwise position, but the fillers or weft threads of which are inclined at an angle of 45 degrees, more or less, to the warp threads.

BICYCLE RIMS. Wood or metal wheel bands of a bicycle. See Rims.

BICYCLE TIRE. A rubber and fabric pneumatic tire, of single-

tube or double-tube construction. Used on bicycles and light vehicles. See Specifications and Sizes.

BICYCLE TIRE CEMENT. Rim cements for attaching single tube tires to wheel rims. They are of two varieties, quick drying rubber solutions, and an easily melted gutta percha compound.

BICYCLE TIRE FABRIC. A square-woven cotton duck, ordinarily of 8 and 10½-ounce material. For bicycle cord tires, 15-ounce cord fabric similar to that for cord tires is employed, using two plies in building.

BICYCLE TIRE SIZES. See Sizes.

BINDER STRIP. A term sometimes applied to the rubber cushion under the tread. See Cushion.

BLEMISHED TIRES. Factory-inspected tires in which defects appear, often sold as seconds, or first and second blemished; a euphemism for N. F. C. tires. See N. F. C.

BLISTER. First: a puffing in or under a tread, due to imprisoned air, sand, etc., caused by neglected tread cuts. Second: a curing defect due to a "bunching" in part of the fabric layer. Third: the result of the expansion under heat of air, moisture or gas imprisoned between plies or pocketed in the tire compound.

BLOCKING OUT. The cutting or stepping of plies of fabric in rectangular sections preparatory to building-in repair sections.

BLOOM. The efflorescence, or the working to the surface, of uncombined or excess sulphur on tires, tubes or accessories.

BLOW HOLES. Perforations resulting from blisters between fabric plies or beneath the tread. A repair term.

BLOWOUT. An explosion of the air-inflated inner tube through fabric rupture of the casing.

BLOWOUT BEAD. A bulging out of line of a bead, sometimes occurring in curing repairs by live steam.

BLOWOUT BOOT. See Boot.

BLOWOUT CHAIN. A device for emergency repair of a rim-cut or blown-out tire, consisting of several loops of chain across the casing, fastened at either side in a plate which hooks on the rim. Used to protect a damaged casing and supplement a canvas inner patch.

BLOWOUT PATCH. Sections of rubberized fabric reaching from bead to bead, placed inside of a punctured or torn casing.

BOLTED-ON TIRE. A method of fastening the tire to a specially constructed rim by means of locking-rims fitted over the bead and retained by bolts. See Rims.

BOOT. A short section of fabric plies with extra rubber for a tread, and laced, strapped or hooked over a damaged casing and about the rim for temporary repair. Occasionally made of rawhide or leather and steel-studded.

BOOTHROYD TIRE. The original single-tube tire, the invention of which is credited to A. Boothroyd, of England, who failed to patent it, and which under other names became for many years the standard type for bicycles in the United States.

BRAIDED FABRIC. Tire-building fabric braided upon a series of annular cores of the size and shape of the tire casing.

BRAKE-SKIDDING. An uneven wearing down of a tire tread due to an abrupt checking of speed and consequent road scraping or to unequal adjustment of brakes.

BRAND. An identification mark placed on their products by tire, tube and accessory manufacturers. The brand on tires may include: the degree of inflation required, indicated by pounds of air pressure for the size and character of the tire; the manufacturer's name, trade name and size of the tire, the size being given in inches and usually also in millimeters; the date of manufacture, generally in code; the serial number, all such markings being molded in relief on the side-wall—and to which may be added the name of the tread pattern, often impressed by a mold on the tread.

The brand on tubes includes: the maker's name; trade name of tube, and the size in inches, and often in millimeters, printed on the tube; the size and serial number molded in the tube, and to which may be added a seal or stamp to indicate that the tube is of the heavy or tourist type, the absence of which seal or stamp implying that the tube is of the regular type.

BREAKER FABRIC. See Breaker Strip.

BREAKER STRIP. A band of coarsely woven, frictioned fabric coated with a soft rubber compound adapted to adhere tenaciously to the stiff tread and designed to break the force of the road blows and so distribute them as to divert carcass break-down.

BROKEN BACKS. A term applied to casings which have their fabric framework practically fractured, the break-down usually resulting from rim pinching or running a tire flat.

BROKEN BEAD. Rupture of the solid rubber core or wire cable and encasing fabric cover of a tire bead.

BUFFING. Roughening of a damaged part with a file, sandpaper, emery-cloth or wire brush to obtain a clean, abraded surface for the application of repair gum or cement.

BUFFINGS. A reclaimer's term applied to the rubber dust produced in the making of new and repair of old tires.

BUILDER FABRIC. (1) Usually a square-woven fabric used in the construction of a tire carcass. (2) For motor tires generally a long-staple cotton is used, also plied yarns, squarely woven and usually weighing 17.25 ounces per square yard. (3) A square-woven fabric usually made from 11-ply yarns in both warp and filling.

BUILDING FABRIC. See Builder Fabric.

BUILDING UP. Overlaying rubberized fabric sections and gum in repair work to conform to the original tire construction; also in repairing large pneumatic truck tire treads, the use of successive layers of tread stock so as to form a semi-flat surface.

BUILT-UP TREAD. A smooth tread made by superimposing strips of tread gum upon one another in graduated widths so that the middle of the tread is thicker than the edges. See Camelback.

BUTT-END ADJUSTABLE FLAPS. Inner-tube protecting flaps or interliners with ends cut flush and sides feather-edged to prevent friction between tube and casing. Often cotton-covered to prevent tube chafing.

BUTT-END TUBE. An inner tube usually with sealed ends made so as to lie within a casing, and butted or jointed together. In one type one end is so rimmed that it will fit within a collar on the other end, and inflation will give an air-tight lock. In another, one end is cone-shaped, fitting into a cavity in the other end, both ends being sealed. An advantage possessed by the jointed inner tube is that it may be applied or removed from a wheel without taking the latter off the frame.

CABLE CORD. Cord used in construction of cord tires, usually made of long-staple cotton comprising four or six unit threads—usually six—about the size of average sewing cotton. After being rubber solutioned until about 40 per cent rubber in weight, they are twisted into a unit cord with a tensile breaking strength of 230 pounds. Such unit cords, in groups of three, four, or six—usually four—are again rubber-solutioned and twisted into a cable cord.

CABLE CORD TIRE. See Cord Tire.

CALENDERED STOCK. Unvulcanized dry mixed rubber in sheet form, with or without fabric backing insertion, or friction, for tire building or repair.

CALIPER GAGES. Instruments using the caliper principle for measuring external dimensions of tires to determine proper inflation.

CAMELBACK. A ready-made tread. A complete tread stock formed in layers with the flattened center much thicker than the sides—used to hasten retread work.

CANVAS. See Fabric.

CANVAS TYRES. A British term for fabric tires.

CARCASS. The body or foundation of the tire casing built of rubberized fabric, cord fabric, or cords, and rubber.

CASES. Another name for casings. See Casing.

CASING. The external covering or shoe of a double tube tire, and excluding the inner tube.

CATERPILLAR TIRE. A trade term given to a form of tire armor made of rejected or worn casings cut into short segments and linked with a chain above the bead around a complete tire.

CEMENT. A general term referring to a substance or composition which causes bodies or materials to stick or adhere to each other. As employed in tire making and repairing, a rubber compound—rarely gutta percha—virtually fused between two surfaces to be united in vulcanizing, or a solution of rubber in a solvent. The efficacy of cement is dependent on various factors, such as the quality of the rubber, the mode of application, the cleanliness of the bodies to be joined, the adhesive attraction of such bodies for the particles composing the cement, etc. In tire building and repair a general rule obtains that the cement stock should be practically the same as the gum in the frictioned fabric or other material of which the casing is made in order that their curing time will synchronize, and defective union through under or overcure be obviated. Pneumatic tire cements include: air cure, acid cure, compound, dough, outer case, patching, plugging, quick cure, rim, self-curing, solid and vulcanizing cement. See Air Cure, Acid Cure, etc.

CEMENTLESS BLANKET. Repair stock in sheet form, usually 1/16-inch thick, to be cut as desired, made with a cured or semi-cured backing and a facing of adhesive unvulcanized gum.

CEMENTLESS TUBE PATCH. A tube patch for emergency repair, made of thin, feather-edged wafers of semi-cured rubber with an unvulcanized rubber backing or "self-cementing" piece of pure gum coated with air-drying rubber cement. See Self-Curing Patch.

CHAFER FABRIC. A light—usually 9¼ ounce—frictioned, woven material applied as a strip over the bead extending from the toe of the bead to a point ½ to ¾-inch above the bead, and underlying the side-wall.

CHAFING. A term comprehending many forms and occasions of tire and tube trouble. Treads of casings may be chafed or worn away abnormally through irregular contact with the road, due to wheel misalinement, driving in street-car tracks, skidding through too sharp application of brakes, and through contact with a fender bolt. Side-walls may be chafed by grazing street curbing, running in rough roads or through heavy sand, or from uneven internal pressure caused by bulging of a casing under a heavy load, or when tire is run flat or underinflated. Fabric plies of casings may be chafed by punctures, through sharp flexing as when the tire is underinflated, by the admission of grit through a break in the outer covering of the casing, or by ill-fitting flaps or reliners. Tubes may be chafed when a bead toe lifts under a load—a slight continuous motion soon rubbing away part of the tube wall—through insufficient inflation whereby it fails to tightly fill up the casing bore, or through the friction on it of the ends or sides of a flap or reliner.

CHAFING STRIP. See Chafer Fabric.

CHAIN-BINDING. Gouging and tearing of tires through excessive use of chains and other anti-skid devices, or through ill fitting of chains; chain wear.

CHAINS. Small rings or links of metal looped transversely on a tire to arrest skidding and give added traction on slippery pavements or on soft roads.

CHAR-À-BANCS. A sturdy type of pneumatic tire generally used in tourist service, especially on motor omnibuses and wagonettes—char-à-bancs; still largely of fabric construction and of clincher type.

CHECKERBOARD. A heavy, open-weave cotton fabric frictioned and skim-coated on both sides and used for breaker strips. See Breaker Strips.

CHECKING. A fault developed in tire side-walls whereby checks, chinks, or minute cracks result, usually from underinflation, curb abrasion, rubber aging, etc.

CLINCHER AUTOMOBILE TIRE. A tire casing having springy, or in many types inextensible, outcurved beads with solid cores which engage the incurved flanges of a clincher rim so that inflation of the inner tube holds the casing firmly in place. The clincher type is based upon the patent of William Erskine Bartlett, 1890, owned by the North British Rubber Co., Limited, Edinburgh, Scotland, and sold, except shop rights, to the Dunlop Pneumatic Tyre Co., of London, England.

CLINCHER BICYCLE TIRE. A bicycle tire open on its inner circumference, the two sides of which have a circular bead or molding which fits into a corresponding groove around the wheel rim, enabling the tire to grip the rim firmly when inflated.

CLINCHER—MICHELIN TIRE. A tire made by Michelin & Cie., Paris, France, under contract (1903) with the North British Rubber Co., Limited, Edinburgh, Scotland, which had acquired the original clincher tire patents of William Erskine Bartlett (1889 and 1890). In this tire the casing had a beaded edge fitting into incurved flanges of a clincher rim, inflation of the tire holding it in place. See Clincher Automobile Tire.

CLOSED-END TUBE. A butt-end inner tube used on bicycles and motorcycles; a non-continuous tube. See Butt-end Tube.

CLOTH WRAPPING. See Bandage Wrapping.

COLD CURE. The surface curing of rubber by the application of a solution consisting of a mixture of chloride of sulphur and bisulphide of carbon, patented by Alexander Parks in England, in 1846. See Vulcanization.

COLD PATCH. Application of a gum patch to a tube with air-drying or acid-cure cement in emergency repair.

COMBINATION CURE. A mode of vulcanization whereby a carcass with its side walls and top cover is first semi-cured, and then the entire casing—after the addition of cushion, breaker, undertread, and tread—is given a final cure.

COMBINATION TREAD STOCK. A repair stock consisting of tread, cushion, and breaker strip formed into a single unit. See Camelback.

COMPLETE SECTION. A repair for blowouts, cuts, etc., in which the ply-cutting or stepping extends across the tire and the section is built anew. See Full Section Repair.

COMPOUND. The rubber compositions used in treads, friction, cushions, skim coats, side-wall, bead center and cement gums.

COMPOUND CEMENT. A vulcanizing cement made of compounded rubber, a typical formula being: fine Pará gum 33 parts, litharge 6 parts, and sulphur 3 parts, one pound being mixed with a gallon of naphtha.

COMPOUND SPECIFICATIONS. Requirements set by the United States War Department as to tire ingredients. See Specifications.

COMPRESSION INNER TUBE. A more or less puncture-proof inner tube having a thick wall and of greater cross-sectional diameter than the space it is to occupy in the casing. When inflated, the walls compress a puncturing object tightly, thus preventing the exit of air; and when the object is withdrawn the compression automatically closes the hole.

CONSUMERS' TIRES. As applied to motorcycle tires, sizes most used, including 26 by 2¼, 26 by 3, 28 by 3, and 29 by 3½. See Sizes.

COORDINATION. The perfect working together through equal adherence, and unified resistance of the various tire parts.

CORD BICYCLE TIRE. A bicycle tire, usually made of two plies of cord fabric so laid as to form two continuous bands of rubberized cords about its entire circumference, each band lying diagonally to the adjacent one and well insulated and cushioned with rubber.

CORD FABRIC. Carcass material made up of rubberized cords in parallel and held in place with a few light "tie-in" cords. See Fabrics.

CORD FABRIC TIRE. A pneumatic tire, the carcass of which is made up of cord fabric.

CORD PATCH. A built-up bias cord-fabric section vulcanized inside a cord tire casing for repairing small breaks beneath a tread.

CORD REINFORCEMENT PATCH. A pad of several layers of cord rebuilding fabric superimposed in graduated sizes, impregnated with rubber and semi-cured. Used either for inside reinforcement of outside sectional repairs, or for mending a casing which has a minor injury in several of its plies.

CORD REPAIRING FABRIC. A textile practically identical with the original cord fabric used in building tires and heavily impregnated with rubber. See Cord Fabric.

CORD SECTION. A repaired section of a cable cord tire through the removal of damaged cords and the insertion of new.

CORD SEPARATION. An injury to cord and cord-fabric tires due usually to sand and water working through tread cuts and resulting in a chafing of one or more of the cord plies.

CORD TIRE. A tire, the carcass of which is built with two layers—as the Silvertown type—of heavily rubberized cable cords placed diagonal to each other, each layer being insulated in rubber. Also a tire of the multiple-cord type, built of cord fabric using smaller cords and more plies. See Silvertown and Multiple Cord.

CORD TIRE TUBES. Inner tubes with thick walls often made with nine plies of laminated rubber instead of the usual six, and designed to better fill out the bore of cord tires which is slightly larger than that of fabric tires, and to offset the inflation strain and chafing to which regular tubes would be subjected in such casings. See Inner Tube.

CORDED FABRIC. See All Warp Tire Fabric.

CORDS. Heavily rubberized cotton cables used in the carcass of cord tires; also, colloquially, cord tires.

CORELESS BEADS. A reclaimer's term for material stripped from the beads of old tires.

COTTON. A basic material forming the skeleton of the pneumatic tire. The proportion of cotton in a tire varies with different makes. In an average distribution of materials 23 per cent by weight may be allotted to fabric.

The varieties of cotton used in tire duck cord fabric, and cords include: American peeler, a strong fiber—1⅜ to 1⅝-inch—grown in Alabama, Mississippi, Louisiana, and Arkansas; Sea Island, a very choice quality, grown chiefly on islands off the Georgia Coast, the fibers ranging from 1½ to 2½ inches; Egyptian, also called "Sak" or Sakellarides, an excellent sort raised in the upper valley of the Nile, with a fiber of from 1¼ to 1½-inch; Peruvian (smooth), with a 1⅜-inch fiber; and American-Egyptian, now grown extensively in the reclaimed, arid lands of the Southwest, and developed since 1910 by government experts from Egyptian Sakellarides into two sorts, Pima and Yuma, after two districts in Arizona in which the experimental growths were conducted. The fiber of American-Egyptian ranges from 1-7/16 to 1-11/16 inches. It is strong and silky, is especially adapted for low number yarns, and is preferred by many spinners for tire fabrics on account of its superior twist.

COUSIN STOCK. A stock that is less supple than cushion but more so than tread, applied between breaker and tread. Designed to lessen road shock to the cushion and the carcass.

COVER. See Casing.

CREEPING. Longitudinal movement of a tire on its rim, or of an inner tube in its casing.

CROSS WEAVE (Square Weave). The plain or square interlacing of yarn or thread as found in tire duck.

CURED-BACK GUM. Sheet rubber with one side cured, used for inside reinforcement of heavy inner tubes, the uncured side preventing adhesion to the opposite side of the tube in repairing.

CURING. Applying heat to effect the chemical union of rubber and sulphur, with or without other ingredients. See Vulcanizing.

CURING SCALE. In steam curing, a table showing the amount of pressure needed to develop proper vulcanizing temperature; as, 40 pounds will yield 286.7 degrees F.; 60 pounds, 307.2 degrees F., etc.

CUSHION. A resilient layer of rubber placed under or over the breaker strip, designed to bind it and the tread firmly to the carcass, and to cushion the carcass from shocks.

CUSHION GUM. See Cushion.

CUSHION STOCK. See Cushion.

CUT FILLER. A rubber dough or putty used to fill tread cuts. See Dough.

DEAD ENDS. Sealed terminals of non-continuous inner tubes.

DEFLATION. Exhaustion or removal of air from an inner tube. Accomplished by rolling the tube from a point opposite the valve, or by connecting the valves with air-suction apparatus. See Deflator.

DEFLATOR. A vacuum pump repair-shop and tire-factory device for withdrawing air from tubes that have been inflated for testing, and to permit the tubes, when new, to be folded, packed, and shipped, or to allow them to be mended after usage.

DEMOUNT. To remove a tire from a rim, or a rim from its setting.

DEMOUNTABLE PNEUMATIC. A motorcycle, passenger, or truck pneumatic tire that may be removed with its rim. See Rims.

DEMOUNTABLE RIM. See Rims.

DEPRESSED TREAD. A tire having a tread with a hollowed out design intended to afford security against skidding.

DETACHABLE DEMOUNTABLE RIM. A rim so made that the tire alone may be removed or that both tire and rim may be removed together. See Rims.

DETACHABLE PNEUMATIC. A motorcycle, passenger, or truck pneumatic tire that may be removed from a wheel rim. See Rims.

DETACHABLE TUBE. The inflatable member of a double-tube bicycle tire, differentiated from the vulcanized-in type used in single-tube tires.

DISMOUNTABLE RIM. A demountable rim. See Rims.

DOUBLE BEAD TIRE. A tire having its bead cores formed of many wire cables embedded in semi-hard rubber, and bisected throughout with four plies of cord fabric to impart extra rigidity and strength to bead and casing.

DOUBLE CLINCH. A type of double-tube bicycle tire, in which the toes of the soft bead casing are made to engage a flange between two rim channels and the heels to fit under the incurving flanges on the edges of the rim. See Rims.

DOUBLE CURE. A manufacturing term. In repairing, a trouble experienced in using cavity retread molds, whereby in vulcanizing adjoining sections a part already cured receives a second and undesired curing. See Combination Cure.

DOUBLE LOCK BLOWOUT PATCH. A frictioned fabric inside patch to hold a blowout or rim cut, with wings with which it can be double-locked over each bead.

DOUBLE TUBE TIRES. An early designation of the modern pneumatic automobile tire, referring to a tire having a removable, inflatable tube included in a protective outer cover, attachable to a rim.

DOUGH. A self-curing, plastic rubber composition for filling tire cuts. See Cements.

DRY CURE. A repair term, applied to the vulcanizing of treads, sections, patches, etc., in heated molds and without direct contact with steam or moist heat.

DRYING. The removal of all moisture from tire material in repair, preliminary to cementing or curing.

DUAL PNEUMATIC TIRE. Two pneumatic tires applied side by side on a truck wheel—but little used now, owing to difficulty in maintaining uniform air pressure and distributing car load.

DUCK PLIES. Layers of tire builder canvas.

DUNLOP TIRE. The prototype of the present-day pneumatic tire. Originally a simple, inflated rubber tube taped on a bicycle wheel and patented in Great Britain in 1888 by John Boyd Dunlop, of Belfast, Ireland. Now a tire of the double-tube variety made by the Dunlop Rubber Co., Limited, and having a wire-edge casing with an endless inner tube.

ELASTIC TYRES. A British term generally applied in patent ap-

plications to all forms of pneumatic, solid, cushion, or other rubber or rubber substitute tires, or tires containing springs or other mechanical devices to afford resilience.

ELECTRIC TIRE. A term early applied to a tire built up of parallel cords laid in two plies transverse to each other and regarded as more "electric" or resilient than a fabric tire. See Cord Tire.

EMERGENCY STRAP. A leather strip wound about a damaged tire as temporary repair. See Boot.

ENAMELING DUCK. A medium-weight, plain-woven cotton duck with laid warp and plied yarn weft, suitable for enameling and used for spare tire covers.

ENDLESS INNER TUBES. Air-containing tubes of the all-circle, continuous type. See Molded Inner Tubes.

EXCEPTIONS. A repair term applying to tires not of standard construction.

EXTENSIBLE BEADS. Semi-hard, stretchable, projecting flanges on the inner periphery of a tire casing, adapted for fitting into the upraised, incurving edges of a clincher wheel rim. See Clincher Tire.

Ten Years' Experience With Aging Tests[1]

By William C. Geer, Vice-President, and Walter W. Evans, Development Manager, The B. F. Goodrich Co., Akron, Ohio.

INTRODUCTION

THE most prominent problem that has confronted the rubber chemist is the prevention of deterioration of vulcanized rubber with age. We deal with a perishable vegetable material, and there is no problem quite so important to manufacturer and consumer as the too rapid change in physical properties on simple standing. On account of this change in vulcanized rubber it has become common practice to build into our compositions excess properties beyond the real needs of service, in order to make allowance and leave after a period of time sufficient quality to withstand the service for which the articles were designed.

In dealing with this problem some years ago the writer analyzed the situation and determined that the first step in its solution, and the most necessary one for immediate use, was a means by which the rate of decay could be predicted. Even, therefore, if a knowledge of means of preservation was lacking it would at least be possible to so handle materials that the maximum life with present knowledge could be determined. This led to a study of accelerated aging tests, and the development of the one described in this paper.

Let me assure you that there has not been and there is not now any attempt to claim perfection, or even near perfection. This paper attempts to describe simply an experience good, bad, or indifferent, as that may happen to be to those who may wish to use it. The facts are that this experiment has proved to be a valuable means of approximately predicting the relative rate of deterioration of a variety of rubber compounds. The proof of the value has been determined over a period of ten years, and I thought that it might be interesting if the experience were to be written and the conclusions presented to the International Rubber Congress. I do not doubt that you will find many flaws in the method, that you will find many differences in the conclusions, and I make no claim other than an attempt to point out one company's results.

HISTORY

The work on accelerated aging extends over a number of years. It is difficult to recognize definitely the contributing factors, much less to distinguish between the ones which had a direct and those which had an indirect influence on working out a test which would have practical significance in the rubber industry. For this reason, in giving a historical outline of the accelerated test the theoretical work on oxidation of rubber is included without any attempt being made to evaluate any contribution to the fund of knowledge on oxidation, or its result, aging.

The earliest observation on the aging of rubber goods was made by Spiller in 1865[2]. He noticed that "patent waterproof felt" after six years' service did not possess the close structure and waterproof qualities of the original article; upon extraction of the rubber goods and evaporation of the residue, a resinous film which differed from the characteristic rubber film was obtained. This product was known as "Spiller's resin" and the phenomenon which was held responsible for its formation was recognized as oxidation.

About the same time W. A. Miller[3] published the results of his findings on investigating the effect of light and exposure to air and moisture of raw and manufactured gutta percha and caoutchouc.

In 1885 Thomson[4] observed that vulcanized elastic fabric oxidized very rapidly on exposure to the air at a temperature about 100 degrees C. The rubber became harder, and the theory was advanced that vulcanization was being continued. He also noticed that ozonized air had little action on unstretched or unstrained rubber, but that it acted very rapidly on rubber thread in the stretched or strained condition.

The first practical accelerated aging test was devised by C. O. Weber[5] and was termed "sun cracking test," the theory being that the detrimental changes in vulcanized rubber goods were caused by oxidation hastened by sunlight. In attempting to duplicate actual conditions in a laboratory test in which the time involved would be appreciably shortened, ozone was at first considered as an oxidizing medium, but was rejected as impractical since it was difficult to secure regularly a gas of uniform concentration. The weighed rubber strips—in this case tire covers—were immersed in a mixture consisting of acetone and hydrogen peroxide for at least two days, after which time the strips were dried at 100 degrees C., weighed and compared with an untreated sample. The increase in weight denoted the amount of oxygen absorbed and was considered a fairly reliable measure of the sun cracking liability of the sample tested.

Herbst[6] studied the action of atmospheric oxygen on purified Pará rubber and the constitution of the resultant products. By passing a current of air through a solution of the rubber dissolved in benzene and heated under a reflux condenser for 140 hours he obtained a light brown liquid and resinous products similar to Spiller's resin.

In the same year Ditmar[7] published a laboratory method for testing the durability of rubber and rubber goods; this method could well be termed an accelerated aging test. It was based on the assumption that the durability of rubber and of rubber goods varied inversely to the ease with which they were oxidized by atmospheric oxygen and thus partially converted into resinous products of the nature of Spiller's resin. The sample to be

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[1] Paper read at the International Rubber Conference, London, England, June 7-13, 1921.
[2] Journal of the Chemical Society, Vol. 18, 44-6, 1865.
[3] Journal of the Chemical Society, Vol. 18, 273-8, 1865.
[4] Journal of the Society of Chemical Industry, Vol. 4, 710-19, 1885.
[5] Weber, "Chemistry of the Rubber Industry," 229-30, 1902.
[6] Berichte der Deutsche Chemische Gesellschaft, Vol. 39, 523-5, 1906.
[7] Gummi-Zeitung, Vol. 20, 628, 1906.

examined was rolled into a thin sheet and dried to constant weight in vacuum over calcium chloride or in a drying oven at 100 degrees C. Four-tenths to eight-tenths-gram of the dried sample was then sealed in a thick-walled tube from which the air had been displaced by oxygen and heated for 5 to 20 hours at 100 degrees C. The tube was then allowed to cool, the rubber removed, weighed rapidly, and the increase in weight taken as an inverse measure of the durability of the sample. The increase in weight shown by a sample of good rubber in five hours amounted to from 2 to 4 per cent.

Ditmar also conducted tests for determining the influence of various constituents, such as powdered glass[8] and barytes[9], on the oxidation of rubber as well as the influence of vulcanization pressure[10].

In connection with work on aging and oxidation one should not neglect citing the work of Harris[11] on determining the structure of rubber by means of ozone, since these researches are of importance in throwing light on the nature and constitution of the rubber molecule.

In a similar sense the discovery by Spence[12] of the presence of oxidases in rubber, as well as his work on after vulcanization, should be recognized for its effect on research along these lines.

The majority of the work on aging from 1906 to date was conducted for the following purposes: to study the theoretical nature of oxidation, to define and determine the oxidation products; and to study the effect of aging on vulcanized rubber in determining the state of cure and the "optimum" or correct cure.

Peachey in 1912[13] carried out experiments on crude rubber to determine the number of oxygen atoms which are concerned in effecting complete "atmospheric oxidation" of the $C_{10}H_{16}$ unit of the rubber molecule. At temperatures in the neighborhood of 80 degrees C. pure rubber was readily attacked by oxygen, and it was not difficult to bring about complete oxidation of a film.

Later Peachey and Leon[14] amplified these earlier researches by conducting a series of experiments on the effect of moist oxygen on vulcanized as well as crude rubber. One of the results noted was that vulcanized rubber oxidized far less rapidly than crude rubber, but that the amount of oxygen consumed was ultimately the same. The oxidation products were analyzed.

Bing[15] had earlier determined the presence of sulphuric acid in vulcanized rubber, and the accelerating, deteriorating effect of copper salts. No change in normal oxidation was observed in nine months, but when copper chloride was used deterioration set in within a week.

A quantitative study was made by Kirchhof[16] on the oxidation products, both of crude and vulcanized rubber.

Gorter[17] and Kerbosch[18], as well as Peachey and Kirchhof, already mentioned, have studied the theoretical nature of the oxidation of rubber. Van Rossem's work[19] in which conclusion that the oxidation of rubber is a secondary process which can take place only when rubber has been previously depolymerized to a definite critical viscosity is not in disagreement with the experiments of the above mentioned. Fickendy[20], by exposing rubber to sunlight in tubes containing air and other gases, proved that the presence of oxygen was necessary to produce tackiness.

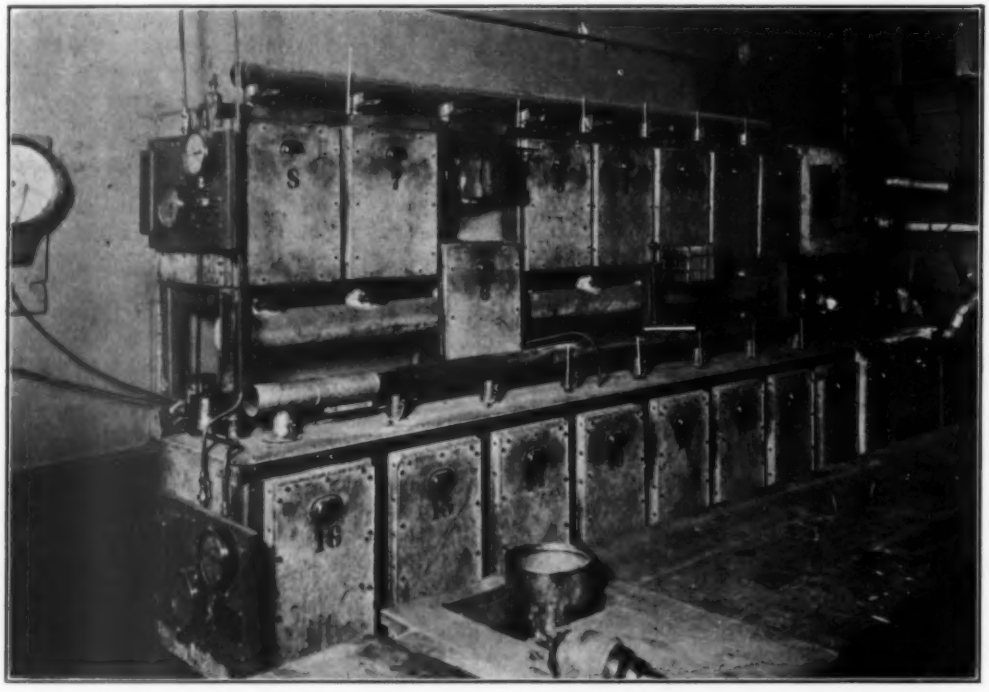


FIG. 1. APPARATUS FOR TESTING AGE OF VULCANIZED RUBBER

The researches of Stevens[21], de Vries[22], Eaton and Day[23] and Schidrowitz and Goldsborough[24] were carried out for the purpose of determining a correct or "optimum" cure. Aging is studied with this purpose in mind and also for its effect on the stress-

[8] Ibid, Vol. 21, 418-9, 1906.
[9] Ibid, Vol. 21, 234-5, 1906.
[10] Chemische-Zeitung, Vol. 31, 638-9, 1907.
[11] Berichte der Deutsche Chemische Gesellschaft. Vol. 37, 2708, 1904; Vol. 38, 1195, 3987, 1905.
[12] Biochemical Journal, Vol. 3, 165, 351. Kolloid-Zeitschrift, Vol. 10, 299, 1912.
[13] Journal of the Society of Chemical Industry, Vol. 31, 1103-5, 1912.
[14] Ibid, Vol. 37, 55T-60T, 1918.
[15] Kolloid-Zeitschrift, Vol. 4, 232-5, 1909.
[16] Kolloid-Zeitschrift, Vol. 13, 49-61, 1913.
[17] Mededeelingen over Rubber, No. 11.
[18] Ibid, No. 111.
[19] The Rubber Industry, 1914, p. 149. Communications of the Netherland Government Institute, Part 4, p. 120.
[20] Kolloid-Zeitschrift, Vol. 9, 81, 1911.

strain curve. In most of their experiments a normal and not an accelerated aging period is used, the time in most cases being at least a year. De Vries, however, heated the vulcanized sample at 72 degrees C. or 65 degrees C. for 12 to 16 days.

The action of light as a factor in accelerating oxidation was studied by de Vries and more recently by Porritt[35].

where a lesser number of tests are to be made and where a standard type of electric drying oven is available, this can be adapted to such work, provided a mechanical agitator is placed inside the oven to insure an even temperature throughout, and a constant supply of fresh air heated to 160 degrees F. is maintained throughout the test. As an example, the type known as

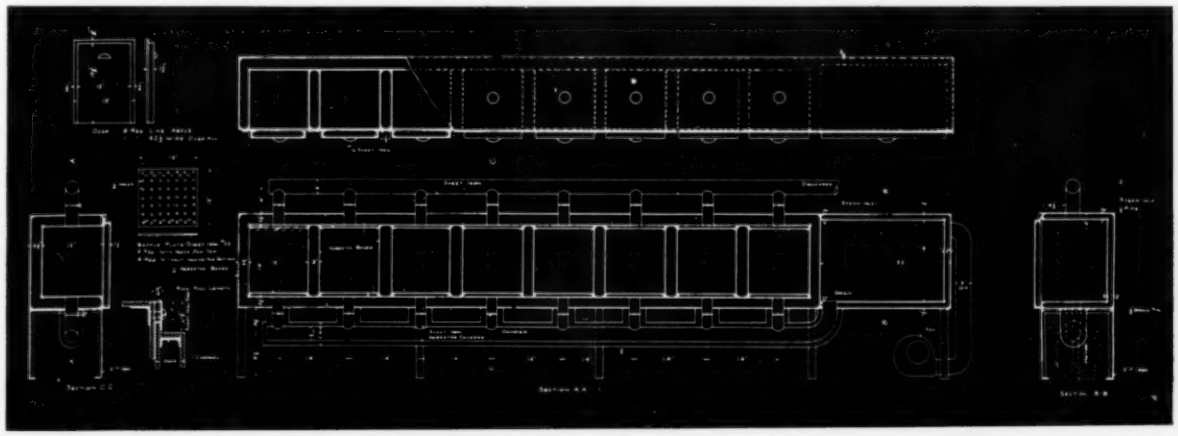


FIG. 2. PLAN AND ELEVATION OF AGE-TESTING APPARATUS

The accelerated life test as worked out and put into practice at The B. F. Goodrich Co. was described at the September, 1916, meeting of the American Chemical Society[36].

The first work done in the laboratories of The B. F. Goodrich Co. on accelerated age tests was in the fall of 1907, at which time a suggestion came to us from Dr. Van Der Linde, of the Gutta Percha & Rubber Co., Toronto, Canada, who used a very fast aging test. He performed it upon three small pieces of rubber. The samples to be tested were put in an air bath of heated air about 140 degrees C. for a period of one, two and three hours, taken out, and examined for cracking, hardening, or to ascertain whether they were becoming soft. This method was not parallel with actual aging in any particular and we came to the following:

PRESENT METHOD OF MAKING TESTS

The age-testing apparatus used in the present method is shown in Figs. 1 and 2. Into this oven, heated air was blown at a temperature of 160 degrees F., care being taken to see that a continuous supply of hot fresh air was added during the entire aging period. A number of samples 3/32-inch thick were previously cut in the form of our standard test strip and placed in this air bath. The test strips were suspended by punching a hole in the enlarged end, passing a wire through and placing between each strip a rubber disk about the same thickness as the test piece, to keep the individual strips separated and allow a free circulation of air so that the entire surface was exposed. The air was then started circulating and the test continued for a period of two weeks, taking out three samples each day. These were allowed to stand for 24 hours at room temperature until they reached a state of equilibrium, after which they were tested for tensile strength and elongation.

While we have referred to a particular type of oven in which to perform these aging tests, we wish to point out that the Freas electric ovens, equipped with electric agitator on the inside, has proved most satisfactory.

The data plotted in curve form give a time-decay curve of the compound. For a long time these were always run in comparison with a standard compound, that is, at least two sets of samples were run at the same time. Thus, by comparing the curve of a compound the age of which we knew, and the curve of a compound which we did not know, we obtained a reliable indication of the service to be expected from this new compound. It is worth while to point out that we consider this purely a practical and not an ultimate test. Our experience, however, based on many thousands of these curves, indicates to us that this method of determining the approximate aging of a commercial rubber product is reliable, and is of great value as an aid to a compounder in a manufacturing plant, permitting him to study the aging of the composition of compounds.

No attempt has been made until recently to determine the probable chemical reactions involved. It seems reasonable to assume, however, that at the temperature employed and with the current of fresh air passing over the samples, an oxidation occurs, forming one of the unstable peroxides and at the same time causing an increase in the coefficient of vulcanization, similar to that resulting from the aging of rubber under normal conditions.

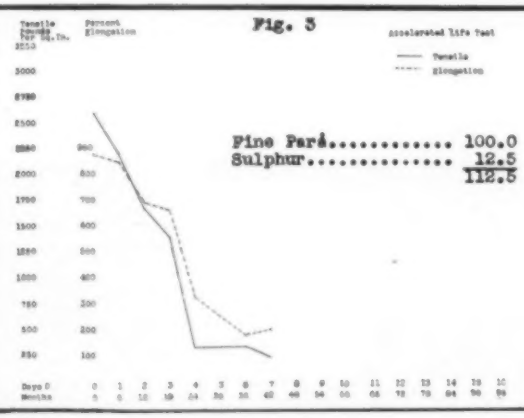
Having now described the method by which the test is performed, let us proceed to examine a few curves taken from the records of our laboratory. We have many thousand curves, and we have chosen a few of those which illustrate certain typical characteristics and of which natural aging data were available.

CURVES SHOWING TYPICAL AGING CHARACTERISTICS

The compound used in Fig. 3 is one of the older types so common in rubber thread. This curve shows the change in the elongation and in the tensile strength over a period of seven days. The curves are sharp and the deterioration was rapid. Fig. 4 shows the decay of the same compound and cure, although tested at a different time and upon different strips. The heavy line is the curve plotted from the data taken from the strips that had been subjected to the aging cabinet described in the foregoing. The broken line is the plot from the data obtained from strips that had been filed away in a dark room kept at ordinary

[35] Journal of the Society of Chemical Industry, Vol. 33, 872-4, 1916; Vol. 37, 280-4T, 305-6T, 340-2T, 1918; Vol. 39, 826A, 1920. The India-Rubber Journal, Vol. 52, 679-80, 794, 1916; Vol. 53, 220-2, 366, 1917.
[36] The India-Rubber Journal, Vol. 53, 101, 1917; Vol. 57, 77, 1919; Vol. 61, 87-90, 1921.
[37] Journal of the Society of Chemical Industry, Vol. 38, 339-45T, 1919.
[38] The India-Rubber Journal, Vol. 52, 615-20, 757, 795, 1916; Vol. 53, 327-8, 1917.
[39] The India-Rubber Journal, Vol. 60, 1159-62, 1920.
[40] The India Rubber World, Vol. 55, 127, 1916.

Fig. 3



Fine Pará	100.0
Sulphur	12.5
	112.5

Fig. 4

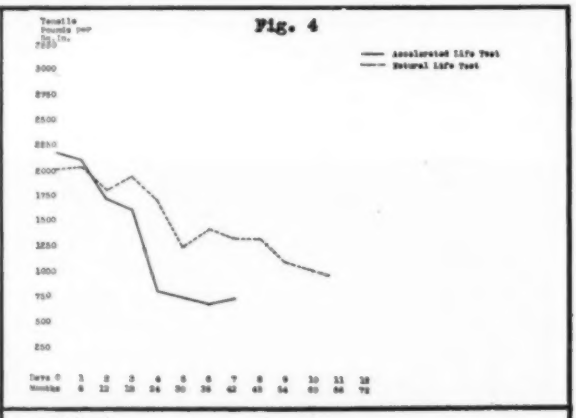
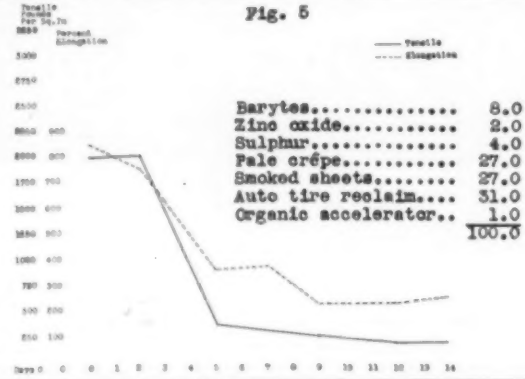
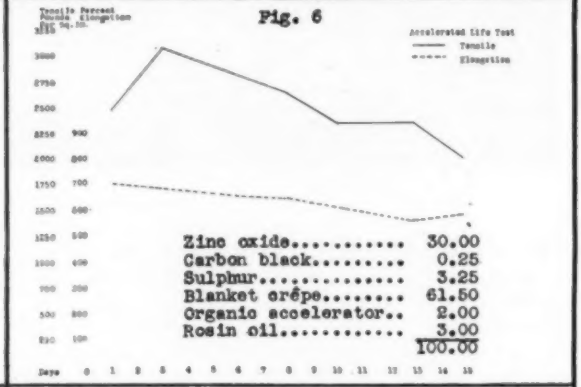


Fig. 5



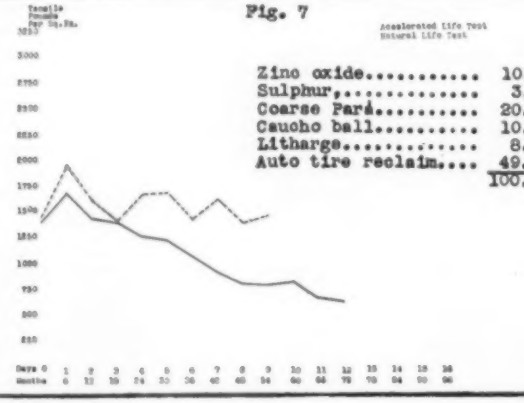
Barytes	8.0
Zinc oxide	2.0
Sulphur	4.0
Pale crêpe	27.0
Smoked sheets	27.0
Auto tire reclaim	31.0
Organic accelerator	1.0
	100.0

Fig. 6



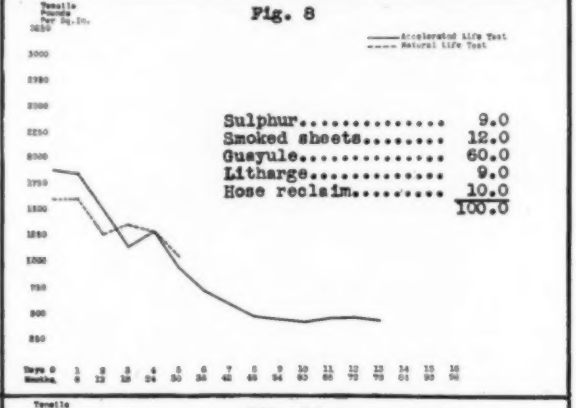
Zinc oxide	30.00
Carbon black	0.25
Sulphur	3.25
Blanket crêpe	61.50
Organic accelerator	2.00
Rosin oil	3.00
	100.00

Fig. 7



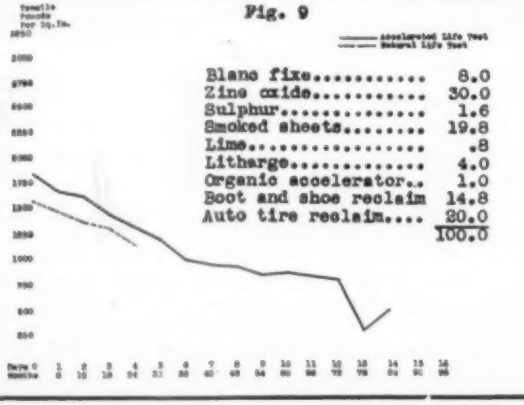
Zinc oxide	10.0
Sulphur	3.0
Coarse Pará	20.0
Caucho ball	10.0
Litharge	8.0
Auto tire reclaim	49.0
	100.0

Fig. 8



Sulphur	9.0
Smoked sheets	12.0
Gusyule	60.0
Litharge	9.0
Hose reclaim	10.0
	100.0

Fig. 9



Blanc fixe	8.0
Zinc oxide	30.0
Sulphur	1.6
Smoked sheets	19.8
Lime	.8
Litharge	4.0
Organic accelerator	1.0
Boot and shoe reclaim	14.8
Auto tire reclaim	20.0
	100.0

Fig. 10

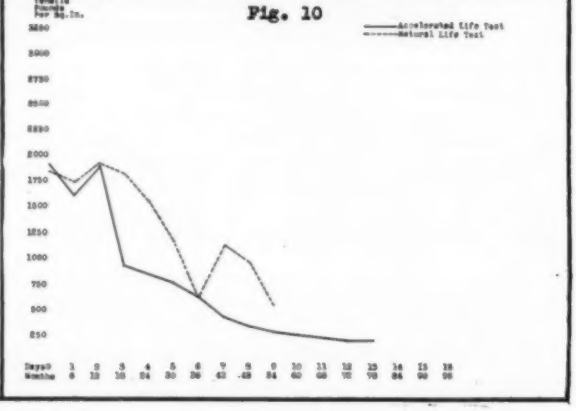


Fig. 11

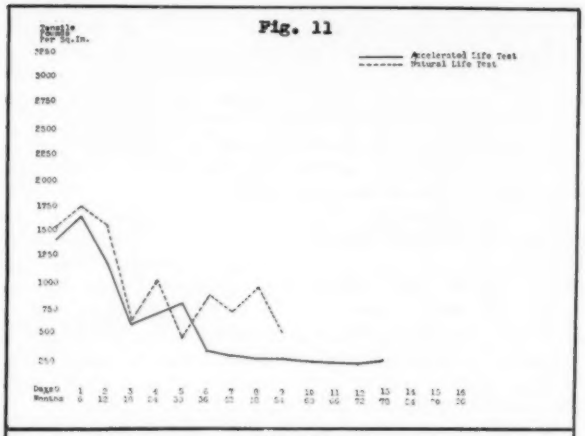


Fig. 12

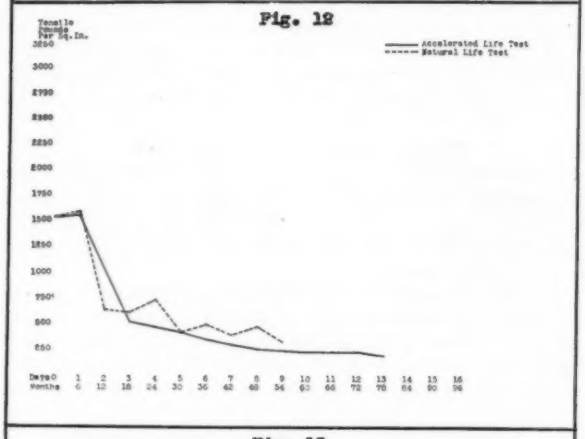
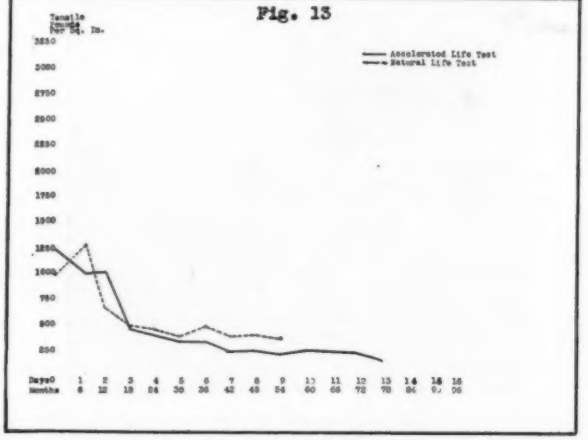


Fig. 13



temperatures and in the dark, and test strips removed at intervals over a period of a little more than five years. From these curves it is to be seen that the accelerated-life test is somewhat more severe than the natural-life test, although there is some degree of correspondence in the general shape of the curves.

The curves of Fig. 5 were made from data obtained as those of Fig. 3, and, like Fig. 3, the curves show sharp deterioration. In each of these cases, we should judge from the experience of our laboratories that the compound thus made and vulcanized would decay too rapidly in natural life.

Fig. 6 shows a different compound and a different cure. It is also chosen to show a wholly different type of aging curve. In this case the tensile strength and elongation have remained at high levels, and one would judge this compound to be a good one. In point of fact it is a remarkably good one, and while we cannot show you the curves from natural life it has stood the test of time in a highly satisfactory manner.

The next diagram to which your attention is invited is Fig. 7. Here have been plotted the data from the natural and short-life tests and tensile strengths only. The compound is one of the older type composed of natural grades of rubber and litharge as the accelerator. The accelerated-life test again shows more severe than the natural aging. These curves may be considered typical, and one of the general conclusions may be anticipated at this point, which is that when an accelerated aging curve shows a type where the tensile strength is nearly constant for the first three or four days and no severe decline following, it is pretty general to find the natural-life test is at least as good, and usually better. One must here warn those who may use this method to gain experience in judging curve data, to follow the method of comparison of unknown with known compositions before predicating any considerable volume of output upon uncompared data.

Fig. 8 is intended to describe a relatively close comparison of accelerated and natural-life tests of a lower-grade composition.

Fig. 9 is the data of a lower-grade compound the natural-life test for which was run but 24 months. The parallelism is fairly close. The fact of the natural tensiles being under the others is probably due to difference in the original mixings.

The next four, Figs. 10, 11, 12 and 13, are from a compound of the type, plantation 50, caucho ball 50, sulphur 8. The first shows how one may be misled, due to irregularities in tensile strength. Of course, in making any curve to relate functional data where irregularities exist one should follow a physical method of averaging, but the average rubber chemist has neither the time nor the facilities for so elaborate a method. We, therefore, are in the habit of disregarding the obviously low figures. In the four diagrams one judges that as the time of vulcanization increases, the rate of decay increases and the parallelism with the natural life becomes more apparent. This we conclude to mean that the short or accelerated aging test can and does show us, if nothing else, how to determine the correct degree of vulcanization necessary to insure the maximum possible length of natural life.

Fig. 14 illustrates the effect of the life test, described in the foregoing, upon the stress-strain diagrams that have been of late discussed so widely. The compounds are of the inner tube variety, that is to say, composed of rubber, sulphur and accelerator. This chart is of a high-grade type and shows the high resistance to aging. There is, as will be observed, but little change in the form of the curves. The compound has become stiffer and weaker.

The last diagram is Fig. 15, in which are shown the results of the aging test upon a similar compound, but one which resisted the effect of the heating to a lesser degree than the one shown in Fig. 14. There is very little that we can say regarding the effect of aging on the stress-strain curves. Our work has had to do more largely with the effect upon that more basic property, tensile strength.

CONCLUSIONS

In the foregoing paper an attempt has been made to describe a test the use of which might permit one to predict the probable effect of natural aging upon culcanized rubber. No one realizes better than the authors, the shortcomings of the presentation and the incompleteness of the proofs offered. So much in our work upon rubber goods is approximate and incapable of any real degree of scientific proof that it is with a feeling almost akin to apology that it has been presented at all. Yet we have worked

with and used this test for a matter of twelve years, and it has so often demonstrated its value that this International Rubber Conference is a most fitting place to tell of its practical value.

Fig. 14

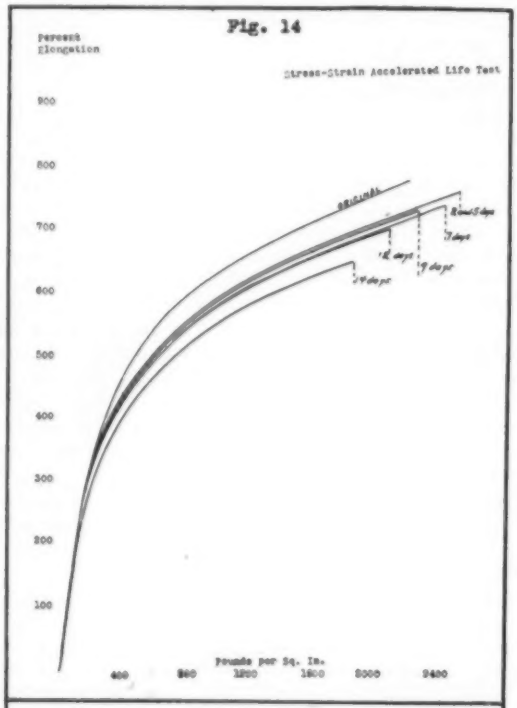
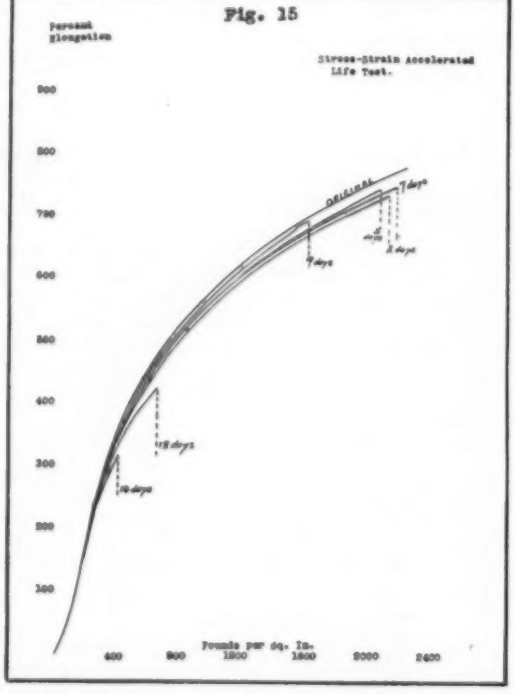


Fig. 15



Let me now briefly review in conclusion the lessons that we feel have been learned during these years.

(1) We consider it more reliable to plot the curves and compare them than to consider the percentage deterioration from the original tensile strength.

(2) The samples are not hardened as in actual aging, but are definitely weakened.

(3) Sulphur changes are noticeable, but not important.

(4) The test is of little or no value when used upon compositions of which the tensile strengths are under about one thousand pounds per square inch.

(5) Despite the fact that the curves of short and natural-life tests do not exactly parallel, the short-life test is somewhat more severe in general than the natural life.

(6) Most important. We are convinced that in the vast majority of cases too rapid deterioration of rubber compounds is due to over or undercure, and chiefly overcure, rather than to any one or more compounding ingredients. This life test with us has been of utmost value in leading us to correctness of cure. Our troubles with organic accelerators, various grades of unfamiliar crude rubber, mineral fillers of various kinds, and so on, have been due chiefly to our attempts to graft a new material upon an old practice and often with fatal results.

(7) This test is a comparative and not an absolute one and should never be used to compare compounds of different type.

(8) When used properly, there has been found to be an approximate correspondence between short-life and natural-life test, after four days in the oven, of one short day equalling six months.

RUBBER HOSE IN DUST-SPRAYING

As an accessory of vacuum cleaners, rubber hose has been long and efficiently employed in removing dust, but it has remained for agriculturists to utilize hose in blowing dust upon growing plants to save them from the ravages of insects and give them a more salable appearance.

The dust is usually a powder containing a large proportion of nicotine, pulverized dry-lime sulphur, or a pure tobacco dust; and aphis, thrips, slugs, codling-moth, and other orchard and garden pests are readily destroyed with such dry-spraying. The average cost of dust and applying to a full-grown walnut tree

DUST SPRAYER DRAWN ON SKIDS BETWEEN ROWS

is 45½ cents. For this work the largest size of power dusting-machine is used, and a 4-inch hose, 20 feet long, is employed. The workers prefer light, rubber, cotton-jacketed hose.

For light truck gardening, hand-dusters—with the powder under pressure—to which are attached 1-inch rubber canvas-covered hose, are much used; but for large ranches a duster operated with gasoline power and mounted on a truck is generally preferred. A small power outfit uses either one 3-inch rubber hose or two of 1½-inch diameter each. Better dust distribution is effected, it is claimed, with the two separate and smaller lines of hose than with the single and larger hose. So, too, the work can thus be done in a shorter time, which means much in checking infestation.

Activities of The Rubber Association of America

P. L. PALMERTON TO HEAD RUBBER INDUSTRIAL DIVISION

IN an endeavor to cooperate with the Department of Commerce, The Rubber Association of America has granted a leave of absence to P. L. Palmerton, manager of the association's foreign trade bureau, in order to enable him to accept the position as chief of the Rubber Industrial Division in the Bureau of Foreign and Domestic Commerce.

The plan of the last-mentioned bureau is to establish, under the direction of Mr. Hoover as Secretary of Commerce, from twelve to fifteen divisions similar to the one referred to, by means of which the interests of the industries represented will be furthered.

Mr. Palmerton's absence does not mean a cessation of activity on the part of The Rubber Association. The service functions of its foreign trade bureau will be practically transferred to Washington, or, when this is impracticable, to New York. Mr. Palmerton will continue to keep in close contact with the interests of the Association, but will also have the advantage of having at command the facilities afforded by the Bureau of Foreign and Domestic Commerce.

REDUCED RATES FOR SHIPMENT OF PNEUMATIC TIRES

The rating on pneumatic tires when in wrapped bales or bundles, less carloads, has been reduced from 1½ times first class to first class in all classification territories. This rating became effective August 31.

ILLINOIS RATING ON PNEUMATIC TIRES REDUCED

The Illinois State Classification, which applies on shipments moving wholly within the State of Illinois, has been amended to provide for a reduction in rating on pneumatic tires in wrapped bales or wrapped bundles, less carloads, from 1½ times first class to first class, and became effective August 10, 1921.

PACIFIC COAST RUBBER GOODS RATES REDUCED

The following rates on rubber products in carloads to Pacific Coast points will be published to apply from all Eastern groups, Atlantic Seaboard and points west thereof:

BELTING, HOSE AND PACKING. $2.10 per 100 pounds, representing reductions from the former rates ranging from 7 to 21 per cent.

RUBBER AND FELT BOOTS AND RUBBER SHOES OR RUBBER SHOES WITH CANVAS TOPS. $2.30 per 100 pounds, representing reductions from former rates of from 1½ to 14 per cent.

PNEUMATIC TIRES AND TUBES FOR EXPORT. $2.50 per 100 pounds, representing a reduction from the former rate of 25 per cent. The effective date of these changes has not yet been announced.

TIRE AND RIM ASSOCIATION

The Tire and Rim Association, during the month of June, 1921, inspected, and approved 1,034,715 pneumatic tire rims in the various plants of the United States and Canada. Following are the respective sizes and number approved:

30 x 3	13,455
30 x 3½	756,123
22 x 3½	8,964
32 x 4	141,435
33 x 4	52,141
34 x 4	4,530
32 x 4½	20,265
34 x 4½	30,884
36 x 4½	1,686
34 x 5	4,437
36 x 6	655
38 x 7	125
40 x 8	15
	1,034,715

TIRE MANUFACTURERS' DIVISION TO MEET IN SEPTEMBER

The first of the quarterly meetings of the Tire Manufacturers' Division will be held in New York on Thursday, September 22, 1921. The Executive Committee will hold its regular monthly meeting on the previous day and such recommendations as may be formulated then will be considered at the division meeting.

STATISTICS REGARDING CALENDERED RUBBER GOODS

The Calendered Rubber Clothing Manufacturers' Division of The Rubber Association was the first among the Association's divisions to prepare monthly statistics concerning production, orders, etc. The total number of rubber coats and sundries for 1920, for instance, was 968,312 pieces, and the total amount of net orders was estimated at 751,245. The tables following are interesting for purposes of comparison:

1922	Production, Cumulative and Monthly. No. of Pieces	Net Orders, Cumulative and Monthly. No. of Pieces
Calendered rubber coats, men's	439,226	386,947
Calendered rubber coats, boys'	207,632	189,904
Calendered rubber sundries, flat	159,619	103,870
Calendered rubber sundries, made-up	161,835	70,524
Totals	968,312	751,245

CALENDERED RUBBER GOODS—1920 VS. 1919

	Production, Per Cent	Net Orders, Per Cent
Flat sundries	Increase 60	Increase 27.5
Made-up sundries	Increase 27	Decrease 35
Men's coats	Decrease 4	Decrease 17
Boys' coats	Increase 53	Increase 9.5

JUDICIAL DECISIONS

NORTH BRITISH RUBBER CO., LIMITED, VS. RACINE RUBBER TIRE CO. OF NEW YORK. United States Circuit Court of Appeals, New York.

The Johnson design patent, No. 45,092, for a tire design consisting of a raised ridge extending around the tire and having extensions forming crosses and diamonds or squares, held invalid as an effort to secure a monopoly of the mechanical excellences thought to inhere in the peculiar arrangement of ridges and hollows, or to prevent the making of tires like those patented in another country by mechanical patent.—*Federal Reporter*, Volume 271, page 936.

TREASURY DECISIONS

Protest of V. Mueller & Co., Chicago, Illinois., July 15, 1921.

DRUGGISTS' SUNDRIES. Articles classed as manufactures of india rubber commonly known as druggists' sundries at 15 per cent ad valorem under Paragraph 368, Tariff Act of 1913, are claimed dutiable under the same paragraph at 10 per cent as manufactures of india rubber.

It was asserted that the articles in question were purchased from a manufacturer of surgical supplies and are not kept in stock or sold by druggists, but are sold direct to physicians and surgeons. As there was nothing in the record to show that they were druggists' sundries, the claim for classification as manufactures of india rubber not specially provided for was sustained.—*Treasury Decisions*, July 28, 1921, Volume 40, No. 4, page 20.

AUTOMOBILE PARTS. The fourth paragraph of Article 15 of Regulations No. 47 (revised December, 1920), relating to the taxation of automobile parts has been amended as follows: Component parts of articles taxable under this definition are taxable when sold separately if they have reached such a stage of manufacture that they are primarily adapted for use as a component part. Thus plates, jars, and separators for automobile storage batteries are taxable when sold separately. Blowout boots are subject to tax as "parts," regardless of the fact that they may be made from old casings.—*Treasury Decisions*, August 4, 1921, Volume 40, No. 5, page 26.

What the Rubber Chemists Are Doing

PROPERTIES AND VALUATION OF PLANTATION RUBBER[1]

TESTING a colloid like rubber, especially as to its mechanical properties, is complicated by the fact that no absolute but only relative values can be obtained, dependent upon many details of the method chosen. Average values obtained are determined to form a base of comparison, and the ordinary variation of plantation rubber has to be determined to ascertain what should be called normal, and what abnormal values. The results of any single test should then be compared with these average and normal values, and the rubber judged accordingly.

STRENGTH OF UNVULCANIZED RUBBER

The strength of unvulcanized rubber, tested in its crude form is certainly not independent of the method of preparation. Data on this point are rather scarce, as the rubber is not in suitable form for accurate tests.

More important for the real quality of the rubber is the resistance to stretching in the vulcanized state, especially at high elongations. This property finds expression in the slope of the stress-strain curve, that is, the ratio of stress to strain. It has hitherto attracted less attention than it deserves. Apart from its own importance, its close relationship to such characteristics as deformation or set, and thereby to the intimate structure of the rubber, should give it a prominent place in rubber testing.

The slope is influenced by factors originating in the latex as well as in preparation. Young trees or heavily tapped trees give a vulcanizate which is less resistant to stretching, and in such cases the composition of the latex must be the cause. Use of sodium sulphite, bisulphite or other chemicals which prevent oxidation of serum substances, and also maturation of coagulum which is accompanied by a decomposition of serum substances, cause an improvement in slope which must probably be ascribed to a change in the non-rubber substances. On the other hand, all the factors which cause a real deterioration (oxidation or decomposition) of the rubber are accompanied by a higher figure for slope, that is, a decrease in quality. It seems, therefore, that slope is a rather complicated property which depends both on the caoutchouc hydrocarbon and on the non-rubber substances.

Besides tensile strength and slope which express the properties of the rubber after vulcanization, the rate of cure is also an important factor upon which attention has mainly been focused. Differences in rate of cure are in the majority of cases, if not always, caused by the non-rubber substances, which act as catalyzers of the vulcanization process, and often in very small amounts. Many of the chemicals which have been tried either as coagulants or for other purposes, have an accelerating or retarding effect; but the powerful catalysts have to be looked for among the substances present in the latex or formed during preparation.

It has been proved that nitrogenous bodies, amines or amino-acids, which have a part in the building up or decomposition of proteins, are, in the majority of cases, responsible for differences in rate of cure. Which amines are actually present in latex and rubber, and in what amounts they work is not yet known. Especially in simple rubber-sulphur mixtures the rate of cure is very sensitive to small differences in content of these by-substances, so that nearly every change, either in the condition of treatment of the trees or in method of preparation, makes itself felt in the rate of cure.

The subject has been studied systematically and the influence of most factors is known, so that the properties of plantation rubber in this respect are now well in hand. Methods of preparation have been worked out which, even with the variations unavoidable in actual practice, assure a sufficiently uniform product.

EXAMPLE FROM ACTUAL PRACTICE

On most plantations the trees are regularly tapped the whole year around, until lately every day, nowadays often on alternate days. The tree adapts itself to the treatment it is subjected to and regularly yields a latex of fixed composition, which represents an equilibrium between what is taken away in the form of latex and bark and what the tree can produce during the period between two tappings. No doubt the regularity in tapping operations together with the adoption of very similar and simple tapping systems, has in later years done much to insure a larger degree of uniformity in the latex and in the output of estates in general.

This regularity in the daily routine was sometimes broken up by the resting of the trees, for instance, during the dry months, at which time Hevea drops its leaves and develops a new crown of foliage. This practice was rather exceptional in Java but seems to have been applied more often in other rubber-producing countries. Of late, resting the trees has been resorted to as a general measure on account of low prices and restriction of output.

The physiological condition of the tree, of course, changes when the regular loss of latex and bark comes to a stop, and the consequence is that when tapping is restarted, a latex of deviating composition is obtained which yields rubber of very abnormal vulcanizing properties. This makes itself felt, especially in the first days or weeks after starting tapping. Gradually, on continued tapping, the condition of the tree changes, until after three or four weeks a state of equilibrium between the condition of the tree and the tapping system is reached again and the usual regularity is restored. The abnormal composition of the latex after resting the trees is evident at once from its color, which is yellow instead of bluish-white. This color remains very evident in the rubber when it is prepared in the form of crêpe, which then shows a deep yellow, often saffron-yellow color. In smoked sheet this irregularity is practically invisible, as it is covered up by the dark-brown color of the smoke.

Another abnormal property of the latex is shown in the rubber content, which on the first two or three days may amount to 45 to 50 per cent or even more, and very gradually drops to 35 or 30 per cent, which corresponds with the state of equilibrium already mentioned. The amount of latex, which on the first tapping is rather small, quickly increases from day to day by virtue of that remarkable property of the Hevea tree, which forms one of the principal pillars of its culture, namely, the wound response. In two weeks the yield of latex reaches its maximum and then drops again somewhat to reach its normal level.

MINOR DEVIATIONS

These are the easily visible signs of the large deviations found when tapping a tree that has had a rest, and it is not to be wondered at that the composition of the latex is also abnormal. This is very much so as regards its content of natural accelerators, which determine the rate of cure of the rubber. The rubber obtained from the first day's tapping vulcanizes with abnormal slowness. Taking 100 as the normal figure for time of cure, a figure of 150 to 160 may be expected for the above abnormal rubber, and even 180 is no exception.

These are values that are never met with in ordinary plantation rubber which on the above scale seldom cures more slowly than in 130 minutes. Therefore, tapping trees that have had a rest means a serious disturbance of the general uniformity of plantation rubber. A yellow color in crêpe may also be obtained in

[1] Abstract of a paper by Dr. O. de Vries, director of the Central Rubber Station, Buitenzorg, Java, read at the Fifth International Rubber Exhibition, London, England, June 3-9, 1921.

other cases, in which the vulcanizing properties are wholly normal. For instance, the ordinary changing over to a new tapping surface is mostly accompanied by a yellow color in the crêpe without any change in its rate of cure or other properties. This is an interesting physiological fact as it shows that the yellow substance in the latex is locally fixed in the tree, in contrast to the accelerators of vulcanization which seem to travel easily through the tree and are present in the same proportion over the whole tapping area.

Besides the properties about which a few details have here been given there are certainly others that are of importance in manufacture, but about which little is known. A systematic study of such points can be arranged only when more is known about the necessary methods of testing and about the ends that should be attained.

REAGENTS FOR VULCANIZATION

An invention has recently been patented[1] for the vulcanization of natural or synthetic rubber by the employment of special reagents to insure the following advantages: (1) the diminution or elimination of the quantity of sulphur which otherwise always remains in a free state in vulcanized rubber, with the consequent elimination of the efflorescence on the articles produced; (2) the elimination of all immediate or subsequent over-vulcanization; (3) an improvement in the mechanical qualities and durability of the product.

The reagents employed in the process are salts of bivalent or trivalent metals of the N., monoalkyl, or N.N., dialkyl, or N.N. alkylene-dithio-carbamic acids or other mono or bisubstituted dithio-carbamic acids, having the general formulas where R′ can be an alkylic or other monovalent radical or chain, R″ an alkylenic radical or other organic bivalent radical with open or closed chain, etc., and Me″ a bivalent metal such as magnesium, zinc, cadmium, mercury, etc., or an inorganic bivalent radical such as uranyl and the like. The letters N. and N.N. are used

$$\left[\begin{matrix}\diagup\!\!\diagdown NHR' \\ C{=}S \\ \diagdown\!\!\diagup S\end{matrix}\right]_2 Me'' \text{ or } \left[\begin{matrix}\diagup\!\!\diagdown NR'_2 \\ C{=}S \\ \diagdown\!\!\diagup S\end{matrix}\right]_2 Me'' \text{ or } \left[\begin{matrix}\diagup\!\!\diagdown NR'' \\ C{=}S \\ \diagdown\!\!\diagup S\end{matrix}\right]_2 Me''$$

as above to indicate that the alkyl or other radicals are bound to the nitrogen atom and not to the sulphur atom. Corresponding formulas may be adopted for the salts of trivalent metals such as aluminum, iron, chromium, antimony, etc.

The process is carried out by adding to mixings of rubber and sulphur suitable quantities of the reagents named. The employment of the salts allows the rubber to vulcanize with the use of a quantity of sulphur less than two per cent of the rubber present, a quantity which may be reduced to 0.2 per cent, whereas by all other known processes of hot vulcanization it is necessary to employ five per cent. The rubber thus treated shows after vulcanization no efflorescence due to free sulphur and cannot be overcured even by prolonged reheating.

[1] G. Bruni, British patent No. 140,387.

SLAB RUBBER [1]

The uniformity of rubber from matured coagulum (slab rubber) has been ascertained experimentally to be not more uniform in rate of cure than crêpe, but the reverse. Whether or not air has access during maturation has little or no influence on the rate of cure of matured rubber.

In each of two series of matured sheets of increasing thickness the rate of cure is observed first to fall with increasing thickness and then to rise. The irregular results obtained are not unexpected when we remember that during maturation the coagulum provides a medium for the growth of every kind of microorganism, at the same time and in competition with one another. As each organism will probably produce different products in different proportions, and as chance circumstances will largely determine which of these organisms will flourish and which will not, we can only expect the formation of a variable product.

We know that the changes taking place during maturation at the exposed surface of the coagulum are different from those taking place in the interior of the mass. The surface becomes coated with an alkaline slime, which does not form when the air is excluded as in the anaerobic coagulation process. The substances which accelerate vulcanization have alkaline properties, consequently we should conclude that the aerobic change must result in a faster curing rubber. Previous negative or irregular results may be due to the relatively small surface of the coagulum exposed to the air. The surface is soft and slimy, and much of it would be washed away during crêping. Hence the exposed surface, although containing accelerating substances in relatively large proportions, might not have much effect on the rate of cure of the whole mass when washed, crêped and dried.

We may conclude that aerobic influences account for the formation of at least part of the accelerating substances. As, however, beyond a certain thickness, an increase in rate of cure takes place, it appears that accelerating substances are also formed under anaerobic conditions.

[1] H. P. Stevens. Bulletin of the Rubbers Growers' Association, 2, 1920, 68-77; ibid 1, 1919, 42-4; ibid 2, 1920, 212-4.

METHOD OF AVOIDING RESINIFICATION

The inconvenience of the resinification and decomposition of india rubber, balata, gutta percha or compositions containing any one of these substances, when vulcanized in hot air has hitherto been obviated by incorporating litharge, or its derivatives, in the rubber, notably in the case of rubber shoes or rubber-coated fabrics. This plan, however, by reason of the temperature and the presence of sulphur, causes the formation of lead sulphide which imparts a black color to the rubber.

If litharge, etc., is replaced by reducing substances it is possible to avoid resinification and retain the colors imparted to the rubber mixing by organic coloring matters. This method allows manufacturing objects of all colors, by the hot-air vulcanization process. The reducing agents used should be easily oxidizable, in order that they may be acted upon by atmospheric oxygen during vulcanization before the rubber itself is acted upon. The presence of the reducing agent in neutral or alkaline rubber compounds facilitates the formation of nascent colloidal sulphur, as well as its vulcanizing action upon the rubber. Their protective action is more effective, the more intimate the mixture, and depends also upon the extent to which they are able to effect the fixation of free oxygen, and the stability of fixation of this oxygen in the molecule of the reducer.

Examples of suitable reducing agents are: hydroquinone, pyrogallol, the tannins and their derivatives, paramido-phenol, glycine, trioxymethylene and other derivatives of formaldehyde, hydro-sulphite, such as those of magnesium, calcium, zinc or soda and its derivatives, the neutral sulphites, etc. The reducing agent should not, in general, exceed ten per cent of the amount of rubber present. A perceptible effect is obtained by the use of two per cent of tannin or hydroquinone, from two to five per cent being sufficient for the hot-air vulcanization, at 130 degrees C. for two hours, of a white composition containing 30 to 50 per cent of rubber, white coloring matters and sulphur.—André Heilbronner, 74 Boulevard Malesherbes, Paris, France. British patent No. 142,083.

LEAD PIGMENTS

In addition to leaded zinc oxide and zinc-lead oxide, two other lead pigments are made directly from ore, namely, sublimed white lead and sublimed blue lead. Sublimed white lead consists of lead sulphate 75 per cent, lead oxide 20 per cent, and zinc oxide five per cent. Sublimed blue lead con-

sists of lead sulphate 50 to 53 per cent, lead oxide 41 to 38 per cent, with small proportions of lead sulphide, lead sulphite, and zinc oxide. Zinc-lead oxide contains from 46 to 50 per cent of lead sulphate, from 52 to 46 per cent of zinc oxide, and a small quantity of zinc sulphate. No zinc-lead oxide is made at present. Leaded zinc oxide may vary from 4 to 20 per cent in lead sulphate, the remainder being zinc oxide with a small proportion of zinc sulphate.

As there are but two producers of sublimed or basic lead sulphate, the output may not be revealed. The production of litharge in 1918 was 44,102 short tons.

[1]Mineral Resources of the United States, 1918, Part I.

MANUFACTURE OF RUBBER FROM THE LATEX[1]

Crude rubber is made direct from the latex, either at the plantation or elsewhere, eliminating evaporation and smoking. The latex is treated with a preservative mixture of very dilute aqueous solution of alkalinized phenol to keep it fluid. Dilute acid sufficient to neutralize the alkalinity of the preservative treatment and acidify the latex is added, whereby nascent phenol is liberated, causing rapid and complete coagulation—the bulk of the impurities originally contained in the latex remaining in solution. The coagulum is then subjected to a mechanical dehydrating treatment adapted to disperse any bubbles formed and to expel much of the moisture contained in the coagulum. Subsequently it may be dipped in hot water, rolled into crêpe and kneaded until solid, or be pressed into blocks. In this way the bulk of the mother liquor and dissolved impurities remaining in the coagulum are sufficiently expelled without evaporative drying or other treatment preparatory to shipment.

[1]British patent No. 159,602. S. C. Davidson, Sirocco Engineering Works, Belfast.

"AKSEL," A NEW ACCELERATOR

"Aksel," the new vulcanization accelerator, is a dithiocarbonic compound and is said to be the most active accelerator known at present. Its activity in comparison with thiocarbanilide or hexamethylene tetramine is dependent upon the kind of compound used for comparison. In a zinc-crude-rubber compound containing four per cent of sulphur, it is approximately 25 times as active as thiocarbanilide, and five times as active as hexamethylene tetramine.

It is a non-poisonous open-chain compound that works well in the lowest grades of reclaimed rubber, and can replace litharge at considerable saving in volume cost. It can be used satisfactorily with litharge, lime, or magnesia, but not with antimony sulphide. It is active in the hot-air cure.

Rubber samples vulcanized three years ago are said to have aged perfectly although they contained so much Aksel that they were cured in three minutes at 50 pounds of steam. This remarkable aging quality is probably due to the polymerization being carried to such a degree in the rubber that it is rendered inert to further chemical change. Because of this quality this accelerator is especially useful in improving the aging quality of very low-grade stocks.

CHEMICAL PATENTS

THE UNITED STATES

PROCESS OF DEVULCANIZING RUBBER CONSISTING IN SUBJECTING vulcanized rubber scrap to the action of oxalic acid.—William Beach Pratt, Wellesley, Massachusetts, assignor to Rondout Rubber Co., East Dedham, Massachusetts. United States patent No. 1,382,669.

RUBBER ARTICLE AND METHOD OF MANUFACTURE, WHICH comprises mixing the rubber with a vulcanizing ingredient by a suitable masticating operation and giving it an extended form, then without further mastication dividing the rubber body into relatively small lumps, pressing the lumps together into a mass having a form approximating that of the finished article and vulcanizing the article.—William C. Geer, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y. United States patent No. 1,382,774.

COMPOSITION FOR SHOE SOLES. A WEAR-RESISTING COMPOSITION body comprising several layers of woven fabric impregnated with and maintained in cohesion by rubber cement mixed with powdered iron ore, the fabric material constituting the major portion of the composition.—Henry K. Eckel, Milwaukee, Wisconsin. United States patent No. 1,383,793.

INDIA RUBBER COMPOSITION COMPRISING A VULCANIZED MIXTURE of a caoutchouc-like substance and vulcanized fiber.—Arthur Nixon, Manchester, England. United States patent No. 1,384,400.

THE UNITED KINGDOM

INDIA RUBBER COMPOSITIONS. RESINS ARE MELTED WITH calcium chloride and filtered. About 10 per cent chloride of lime and 2½ per cent of calcium chloride are added and the mixture distilled. That which passes over at 160 to 180 degrees C. is separated from the oils passing over at 340 degrees C. These oils are again distilled with addition of 4 to 6 per cent of chloride of lime and the oil chlorinated by a third distillation with 10 to 40 per cent chloride of lime. To this product is added 1/6 of regenerated rubber previously extracted by ether or alcohol to remove tarry impurities, or 1/12 new rubber to form in 12 to 24 hours a pasty mass. Oil from the second distillation is added and the whole is vulcanized as usual.—G. F. de la Rosée, Garmisch-Partenkirchen, Bavaria, Germany. British patent No. 164,006.

HEEL AND SOLE COMPOSITION. THE FOLLOWING PARTS BY weight: solid tire scrap, 22; heel scrap, 10; black pigment, 3; magnesium oxide, 13; sulphur and lime, ¼ each; reclaimed rubber, 7; crude rubber, 4; and floating substitute, 2. This mixing is vulcanized 25 minutes in an ordinary press and cooled five minutes.—A. A. Crozier. Cambridge Street Rubber Mills, Bradford Road, Manchester. British patent No. 164,159.

THIO-UREAS ARE OBTAINED BY INTERACTION OF CARBON bisulphide and aliphatic or aromatic amines at temperatures above the boiling point of the bisulphide, and between the melting and boiling points of the amines. If aniline is used, it may be mixed with 0.25 to 5 per cent or more of sulphur as a catalyst and heated with stirring to 88 to 92 degrees C. while a stream of carbon bisulphide vapor, with or without a little liquid bisulphide, is passed through it. The temperature may be raised slowly to not to exceed 110 to 115 degrees C. The escaping vapor passes through a condenser and an aniline scrubber to remove carbon bisulphide, and the residual hydrogen sulphide may be burned or absorbed in caustic soda. When the reaction has materially slackened, the supply of carbon bisulphide is stopped and the liquid heated to 130 to 135 degrees C. and then run into a churn containing cold water. Steam is passed through the pasty product to remove free amine, the water is drained off, and the product dried in air or vacuum. The process may be applied to toluidines, xylenes, amino-dimethyl-aniline, amino-cymene, etc.—The Goodyear Tire & Rubber Co., Akron, Ohio, assignee of W. J. Kelly, Akron, Ohio, and C. H. Smith, Edgewood, Maryland. British patent No. 164,326.

PLASTIC COMPOSITIONS. A MOLDABLE COMPOSITION APPLICABLE as a substitute for vulcanite, consists of peat, sawdust, or other vegetable fiber, india rubber, gelatine, sulphur, lampblack, shellac, and stearine pitch.—F. L. Schauerman, East Twickenham, Middlesex. British patent No. 164,392.

GERMANY

INSULATION FOR SUBMARINE TELEPHONE CABLES. GUTTA percha partly or completely freed from resin and then mixed with natural or synthetic rubber possesses certain advantages over

untreated gutta percha as an insulating material. Felten und Guilleaume Carlswerk A.-G. German patent No. 303,871, April 15, 1916.

OTHER CHEMICAL PATENTS

GERMANY

PATENTS ISSUED, WITH DATES OF ISSUE

340,491 (January 27, 1920) Process for vulcanizing rubber and similar substances. The Dunlop Rubber Co., Limited, London; represented by R. H. Korn, Berlin S. W. 11.

LABORATORY APPARATUS

USE OF ALUNDUM FOR FILTRATION

THE alundum filters, funnel and crucible, have many advantages over the old funnel, filter paper and porcelain crucible in that there is no carbonaceous matter to reduce the precipitate when it is ignited. However, the filtration of finely divided precipitates is difficult except in the finest grades and sometimes they do not retain the precipitate. They are also slow if there is much of a precipitate. The same can be said of the old Gooch crucible when its asbestos mat becomes filled with precipitate.

Therefore, to speed up the filtration, retain the finest precipitates and do away with the reduction of the precipitate, the following method was devised:

A thin asbestos mat, just enough to cover the holes, is put into an ordinary Gooch crucible. Then "RR" alundum powder, 90-mesh, alkali free, for carbon determinations, is put in to form a mat about one-quarter of an inch deep. It is then washed with a wash bottle until the surface is flat. The whole is then dried in the oven, when it is ready for use.

Care should be taken when the precipitate is poured into the filter not to wash the alundum away from the sides. The alundum should be covered with precipitate before the suction is applied. After filtration, the Gooch is dried or ignited as desired. This method has been found much faster and more efficient than any of the regular methods of filtration.—I. C. Guest in *The Chemist-Analyst.*

HOME-MADE POLICEMAN

The home-made policeman herein described has given good service. Close one end of a piece of rubber tubing with a tight-fitting solid-rubber plug (one of the "cores" obtained in boring rubber stoppers) and slip the other end of the tube onto a glass rod until the rod meets the plug. With a sharp knife cut through the tube and plug so as to produce a smooth, flush end surface and leave about one-half inch of the plug in the tube.

Incidentally the cores cut from rubber stoppers come in handy for a variety of purposes, such as closing the ends of glass tubes, for which none of the standard stoppers are small enough, plugging up the holes in rubber stoppers, etc. They are especially valuable as a substitute for the usual glass plug for closing the end of the Bunsen valve tube in a wash bottle. These tubes become "dead" and loose after long use with boiling water, and fall into the wash bottle. Where glass plugs are used a broken bottle sometimes results.—Seth S. Walker in *The Chemist-Analyst.*

UNITED STATES LITHOPONE PRODUCTION

It is estimated that the rubber industry consumed 7,700 tons of lithopone in 1919. The quantity, value and average selling price of lithopone marketed in the United States in 1919 and 1920 follows:

Year	Short Tons	Value	Average Sales Price Per Ton
1919	78,365	$10,218,850	$130.40
1920	89,373	12,484,925	139.69
Increase	11,008	2,266,075	9.29
Percentage	14.0	22.2	7.10

The New York market quotations showed very little variation throughout 1920, the lowest price being 7¼ cents per pound and the highest 8½ cents. The average quotation for the entire year was 7.9 cents.

BASIC CAUSES FOR STICKINESS IN CRUDE RUBBER

By André Dubosc

I REVIEW again the work of Brindejonc, especially as his conclusions may have an excellent effect not only upon African rubbers, but on Central and South American rubbers as well, and perhaps upon plantation rubbers. Brindejonc's and my own observations are briefly summarized below.

Sticky rubber is black, devoid of elasticity, and thereby has lost the greatest part of its value. In order to determine the reasons for this change, Brindejonc made a series of tests in which he used Landolphia rubber. By extraction from the dry Landolphia bark he obtained sheets of rubber, which were very spongy and sensitive to the slightest causes of deterioration.

GENERAL CAUSES OF STICKINESS

The following factors in the deterioration of rubber were studied: (1) The action of salt, which is used generally as a coagulant in the Niger and Soudan regions; (2) The action of dilute acetic acid and carbolic acid, which can be formed in the serum if the latex commences to ferment. (3) The action of heat without light, within the limits in which it is met in practice; (4) The action of sunlight; (5) The action of diffused sunlight.

During these experiments, a fact of great significance was developed, namely, that the rubber which has been affected by one or the other of the agents indicated above, continues to deteriorate, even when the primary cause of the deterioration has disappeared.

Therefore when a mass of rubber begins to become sticky it will continue so until the entire mass has been converted into a viscous product. The goods made from this rubber are bound to deteriorate in spite of vulcanization. They are even capable of contaminating other manufactured rubber goods with which they come in contact.

SALT AND ALKALINE CHLORIDES HARMFUL

Samples of standard Landolphia rubber or of Landolphia bark were dipped into solutions of sodium chloride of the concentrations 1 to 100, 1 to 250, and 1 to 500. In humid atmosphere and a temperature varying from 25 to 40 degrees C., when the tests were made in the dark, the action of 1 to 100 solution was apparent at the end of 20 days. The other two solutions—1 to 250 and 1 to 500—did not have any effect until 30 days had elapsed. Hence very small amounts of salt in the rubber, even when the rubber is not exposed to sunlight, are able to produce the phenomenon of sticking.

Up to the present time no importance has been attached to the presence of sodium chloride in the ash obtained by the burning of rubber. Brindejonc's work shows that salt, far from being inoffensive, is capable, although the action is slow, of causing the entire mass of rubber to become sticky throughout. From its outward appearance, the rubber containing salt is apparently in a good condition.

It is of the highest importance, in analyzing old rubber, to determine its sodium chloride content, for its tendency to stick is a direct function of its salt content. If this is greater than a few thousandths of a per cent, the rubber should be washed immediately to prevent it from becoming sticky. In using rubber to coat fabrics, it is important to see whether or not the sizing used in the cloth contains any traces of salt or of magnesium chloride, which is often used for this purpose. This substance, just like common salt, is capable of producing the phenomenon of sticking in rubber coatings, even though the merchandise is placed where it is absolutely dark.

Here is one of the causes of rubber sticking, which is very little known and to which we cannot call the attention of the

rubber manufacturers too often or too strongly: the presence of alkaline chlorides, or alkaline earth chlorides, either in the rubber or in the sizing of the fabrics.

ACETIC ACID CAUSES STICKINESS

Under the same conditions of exposure to light and of temperature, Landolphia bark or thin sheets of rubber, impregnated with very dilute solutions of acetic acid and carbolic acid, change in fifteen days and the sticking action develops with rapidity. This phenomenon is produced even in samples placed in sealed tubes or in flasks with ground stoppers which have been previously sterilized. The action of acetic acid is particularly important as it is used universally in producing the coagulation of plantation rubber.

Rubber which has not been washed sufficiently after coagulation and contains traces of acetic acid, is capable of becoming sticky very rapidly, particularly when in the form of thin sheets. This is the case with rubberized cloth.

DRY RUBBER IMMUNE IN THE DARK

Rubber free from harmful substances, or rubber coagulated with salt, but absolutely dry, does not deteriorate no matter how long it is exposed to the action of heat in the dark. The enzymes to which the deteriorative action is assigned, are incapable of acting in an anhydrous medium. However, if moisture is present then sticking takes place at once on standard rubber as well as on the salted rubber. Moreover, the development of the sticking action is more rapid as the temperature increases.

SUN BURNED RUBBER

Three samples of Landolphia rubber were exposed to sunlight. One was placed in dry air, another in an atmosphere saturated with moisture and the third in water. At the end of two hours the first two samples had become sticky. The sample placed in an atmosphere saturated with moisture was even more strongly attacked by this deteriorative phenomenon than the sample in the dry atmosphere. This difference becomes more pronounced as the exposure to the sun increases. On the other hand, the sample immersed in water did not undergo any change, even after an exposure to the sun for twenty days.

Other samples of rubber were exposed to direct sunlight, one under water, the other under a protective covering of a saturated solution of alum. After four hours, the first sample became sticky while the other remained intact.

We may therefore conclude that it is the heat of the sun that brings about the phenomenon of sticking. The raw rubber is burnt to a certain extent, analogous in a marked degree to the action of the sun's rays on the skin, resulting in sunburn.

LIGHT, HUMIDITY AND ELEVATION

Light of moderate intensity does not produce the sticking, even at the end of three years of exposure. If the light is strong, however, the rubber becomes sticky. The rapidity of this action increases as the humidity of the air becomes greater. An elevated temperature promotes the reaction.

The action is very marked on ordinary commercial Landolphia rubber in balls, and at a constant temperature it is more rapid than on the samples described above. The ease with which sticking is produced is probably due to the salt that is used in the coagulation process.

DUBOSC'S AGREEMENT WITH BRINDEJONC

In my agreement with Brindejonc, I have confirmed by repeated experiment that once sticking commences in a rubber, no matter what the cause of the same may be—the action of light, the presence of acids or chlorides—the phenomenon continues and it is not possible to restrain its action.

If the rubber containing the substances causing sticking in the dark has not yet been attacked, then a prompt, vigorous, and thorough washing is the best way to prevent the action from setting in. If the phenomenon has set in, it is then impossible to stop it, as formaldehyde, bisulphite and all the other antiseptics are of no avail.

FALL MEETING OF AMERICAN CHEMICAL SOCIETY

THE fall meeting of the American Chemical Society will be held with the New York Section, September 6-10, and will probably be the largest meeting that has yet been held. There are 2,500 members in the New York section alone, while thousands of other members are within a few hours' ride of the city. In addition to these a considerable number of British and Canadian members of the Society of Chemical Industry are expected, who will have held their annual meeting in Canada. They will be greeted at the border by the Governor of this state, and will arrive in New York, September 7. After being the guests of the American Section of the Society of Chemical Industry at luncheon September 7, they will then become guests of the American Chemical Society for the remainder of the week. Three or four hundred British and Canadian members will probably be present, as well as three or four thousand from the American Chemical Society.

Accommodations will be provided at the Waldorf-Astoria hotel, Fifth avenue and 33rd street, New York, the headquarters for the meeting. In addition Columbia University has offered the facilities of its dormitories. Rooms for men, rooms for women, and rooms for married couples have been reserved at the rate of $1.50 per day per person, with a maximum per person of $10 for the period September 6-16, for those wishing to stay for the Chemical Exposition. Applications, giving names of those in party, type of reservation desired, maximum price per day per person, time of arrival, expected departure, should be forwarded to Charles F. Lindsay, chairman of the Hotels Committee, care of United States Rubber Co., 1790 Broadway, New York. All members and their guests, including ladies, should register immediately upon arrival. The registration office will open at The Chemists' Club, 52 East Forty-first street, Tuesday morning, September 6. After Tuesday it will be at Columbia University.

The Council Meeting on September 6, will be held at The Chemists' Club. All general, divisional, and public meetings, will be held at Columbia University.

RUBBER DIVISION MEETINGS

The meeting of the Rubber Division will be held September 7-9, at Columbia University. The tentative program is as follows:

1. "The Tetra-Hydroxyphenyl Derivative of Rubber and its Tetra-Methyl Ether." Harry L. Fisher and Harold Gray.
2. "Mineral Rubber." C. O. North.
3. "The Determination of the Particle Size of Pigments." W. W. Vogt.
4. "The Action of Volatile Organic Solvents and Vulcanizing Agents on Organic Compounding Materials and Resinous Gums." Frederic Dannerth.
5. "Corrected Stress-Strain Curves for Rubber." J. W. Shields.

THE SEVENTH NATIONAL EXPOSITION OF CHEMICAL INDUSTRIES

The Seventh National Exposition of Chemical Industries, which will be held September 12-17, in the Eighth Coast Artillery Armory, New York, N. Y., will undoubtedly prove to be the biggest chemical event in the history of the country. The growth of the industry during the last seven years is plainly indicated by the extent of the exhibits, as more than 400 will be displayed on one floor.

The interest shown this year in the exposition by foreign countries is an important feature. Great Britain and Canada will undoubtedly be well represented in various ways, while many scientists and chemists who will attend the meetings of the American Chemical Society are expected to be present at the Exposition.

The Manufacture of Rubber Stamps

IT is conservatively estimated that the rubber stamp manufacturers of the United States employ $15,000,000 capital in producing an output of rubber stamps variously estimated and ranging up to $5,000,000 annually.

Rubber stamps are almost as indispensable in business activities as the telephone. They are believed to be an American invention and are produced and used in the United States more extensively than in any other country. The average usefulness of a rubber stamp is placed at from two to three years. The amount of stamp rubber required to make the annual trade requirements would run into many tons.

The rubber stamp trade includes many devices other than rubber stamps and type, such as stencils, dies, checks, tags, presses and other time-savers useful for business purposes. Several interesting journals are especially devoted to the development of the stamp trade interests which are quite distinct from the field of rubber manufacturing in general.

MAKING RUBBER STAMPS

Rubber stamps may be made from ordinary printers' typeforms, wood-cuts, electrotypes, line cuts, etc. From any of these printing means a rubber printing stamp is made by first taking an impression of the form in a plastic medium that may subsequently be hardened and used as a mold in which to vulcanize the rubber. To form such a mold one may use a matrix composition or plastic mold-board.

MATRIX COMPOUND

The matrix composition is a quick, hard-setting mixture consisting of 8 parts of plaster of Paris, 8 parts of China clay, 3 parts of talc or French chalk, and enough Indian-red iron oxide to give the matrix a pink tint. Any mineral color may be substituted for Indian-red if desired. The mixed dry ingredients are brought to the consistency of soft putty by stirring up in a bowl with a hot water solution of dextrine in the proportion of 3 to 4 ounces of dextrine to one gallon of water. The function of the dextrine is important because it regulates the rapidity with which the plastic composition sets into a hard matrix, in other words its plasticity and toughness. The larger the proportion of dextrine the slower the setting effect.

MOUNTING COMPOUND FOR IMPRESSION

The soft composition is spread on a metal mold-plate, Fig. 1, with raised edges to regulate its depth when struck off with a metal straight edge with which the surface is smoothed and made level with the tops of the bearing edges. If much of the composition adheres to the scraper it is an indication that the composition is too soft and should be allowed to harden more before proceeding with the leveling. If much too soft, dry composition may be well worked into the mass and rescraped onto the mold-plate.

The Barton Mfg. Co., N. Y.

FIG. 1. MOLD PLATE

MAKING THE MATRIX

The type form is set in place on the bed of a hand-press. Its face is covered with a piece of fine muslin and overlaid with tough tissue paper of the same size. Some operators substitute a single thickness of dental rubber dam in place of muslin and tissue. Three impressions are necessary to properly form the matrix, according to the following directions:

FIRST IMPRESSION. The mold-plate, on which the compound is smoothly spread, is laid face downward on the cloth and paper-covered type. The whole is pushed into a hand-press and light pressure applied for a moment. Releasing the pressure and removing the cloth and paper from the mold-plate reveals a rough outline of type form.

SECOND IMPRESSION. After allowing the compound to harden somewhat more, the face of the type is brushed with naphtha, making certain that each letter is well-oiled. This keeps the compound from adhering to the type. The mold-plate is placed again on the type in its previous position but without the muslin and paper covering. The second impression is taken with a little more pressure than the first. When the plate is removed a shallow but exact impression will be found molded by every letter.

THIRD IMPRESSION. The face of the type having been again brushed with naphtha, the mold-plate is again set in position and a third impression promptly taken, applying sufficient pressure to give the desired depth to the lettering. On removal of the mold the face of the impression should have a nicely polished appearance. If it does not present this condition and is still soft enough to be easily impressed by the finger, another impression may be taken. If, on removing the mold plate from the type form at any time, it is found that any of the compound attaches to the type, it indicates either that the compound was too hard or that too great pressure was used, thus making the mold too deep.

DRYING THE MOLD

After the last impression is made and the mold has set until it feels like wax, the surplus compound which has been forced up between the lines of the impressions is trimmed down with a long-bladed sharp knife. The rough particles that result from the trimming and overhang in the type impressions can be brushed out after the mold is thoroughly dried and hardened. A dry scrubbing brush is suitable for this purpose.

Another method for smoothing down the mold after it has thoroughly dried and hardened is to smooth down the ridges with a piece of medium sandpaper. The type impressions will fill up with the resultant dust, which is removed by turning the mold upside down and sharply tapping the corners of each end on a bench or other solid surface. The remaining dust is blown out with a bellows or by other means. Every particle of dust must be removed, or when vulcanizing, the rubber cannot completely fill the letters, periods, etc.

DRY THE MOLD SLOWLY. The mold can be dried by applying to it evenly a moderate heat, in any convenient way. It should be placed face up over a kerosene or alcohol burner, on a gas heater or an electric vulcanizing plate. The heat must be very moderate, especially at the beginning. If the mold is dried too rapidly it will crack around the edges of the letters or different parts of it may "pop" or burst out and spoil the entire mold.

After drying the mold at a low heat for about half an hour, much of the moisture will have escaped from the compound. More heat can then be gradually applied until the mold is absolutely dry.

Should any moisture be left in the compound, the mold would be destroyed during vulcanization.

TO DETERMINE WHEN THE MOLD IS DRY, place a small, dry mirror, glass down, on the face of the mold for a few minutes. If there is any moisture present the face of the mirror will be steamed. Do not attempt to vulcanize when the mold is in this condition. Have it absolutely dry. In the end much time and expense will be saved. After the mold is absolutely dry, smoothed down and cleaned out, it is ready for vulcanizing.

MOLD-BOARD MOLDS

A very expeditious method of making vulcanizing molds for rubber stamps is by means of a plastic preparation mounted on a card board base. This combination mold-stock comes in sheets

of convenient size and is easily cut to suit the requirements of use. In practice the mold board is cut large enough to afford a liberal margin around the impression of the type-form to strengthen the mold. To make a mold, the mold-board mounted on an iron pallet, shown in Fig. 1, is dusted with talc and pressed face downward against the type-face, also dusted with talc. Under usual conditions the full depth mold can be obtained at the first impression in the hand-press. If a deep mold is required, the matrix compound is better than the mold-board. In damp weather the use of naphtha is used on the type-face to prevent the mold-board sticking. To free the mold from the type, tap the bottom of the pallet or type-form on the press-bed. An attempt to pull the mold from the type invariably results in breakage of the mold. Fig. 2 shows type and mold-board impression.

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FIG. 2. TYPE TIE-UP AND MOLD-BOARD

STAMP GUM

There are several varieties and qualities of stamp gum suited to rubber-stamp making. Unvulcanized sheet gum for rubber stamp work is calendered 1/16-inch thick and applied to holland cloth which preserves a high gloss surface on the gum and allows the material to be conveniently handled and cut to size. The usual cure for this gum is ten minutes at 60 pounds of steam (307 degrees F.).

For the ordinary run of hand stamps a cheaper grade, put up in similar fashion, is furnished, curing in eight minutes at 80 pounds of steam (323 degrees F.). A hard curing gum, calendered 1/16-inch thick and applied to holland cloth, is made for making hard rubber stereotype printing plates. It cures in ten minutes at 80 pounds of steam (323 degrees F.).

Rubber type are made from semi-cured rubber 7/16-inch thick. It is inferior in grade to either of those mentioned above and cures in ten minutes at 60 pounds of steam (307 degrees F.).

Rubber stamps are frequently mounted on sponge rubber backing to secure good impressions on uneven printing surfaces. Backing stock of this sort is sold to the stamp manufacturer in cured slabs 20 by 20 inches in thickness of ⅛, 3/16 and ¼-inch.

CURING RUBBER STAMPS

The method of curing stamps in open-steam vulcanizers is superseded by curing in a press. The latest form of this method is by utilizing electricity for heating the press platens, and is shown in Fig. 3. Fitted on the interior of these press-plates are a number of thin metal electric resistance plates or space heaters. These distribute the heat by contact through the faces of the platens and supply the temperature for curing stamps. Owing to the ribbed construction of the upper side of the top vulcanizing plate and the under side of the lower plate, the press remains cool and can be used at all times for making molds.

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FIG. 3. ELECTRIC RUBBER STAMP VULCANIZING PRESS

Rubber-Set Fur, or "Artificial Fur"

A New Product Indicated by the Nowell Process

THAT both rubber and gutta percha are used in the manufacture of fine furs is well known. The use of the former is indicated when pointed furs are produced, that is, when the long hairs that give value to a skin are set into the shorter ones and kept in place by thin cemented cuts. The use of gutta percha in the form of tissue is for a backing when bits and scraps of fur are brought together to form whole skins.

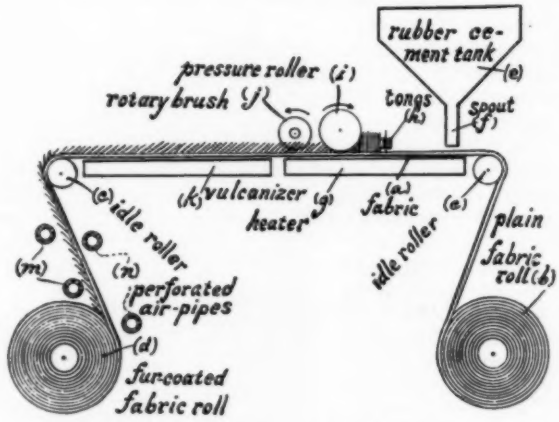
The manufacture of fur by the yard is, however, a long step ahead of the work mentioned. To begin with, fur is warm and of value chiefly because of the presence of two types of hair, the fur itself with hairs short, downy, and barbed longitudinally, and the over-hair, which is straight, long and stiff. The over-hair keeps the fur from matting and thus makes it of value for wear. A machine that can build up hairs, both fur and over-hair, and in its ultimate development copy any kind of fur, from squirrel to sable, is indicated by the Nowell invention. A description of the new machine and process follows:

The apparatus consists essentially of a stand supporting a heating device, using electric coils or steam—indicated as (*g*) in the accompanying diagram—and a vulcanizer marked (*k*), also using either of the forms of heat mentioned. Over both of these units passes a strip from a roll of duck or other sheet-form material (*b*) to be fur-coated and wound upon another roll (*d*). As the fabric passes over the first idle roller (*c*) it receives across its entire face through the flattened spout (*f*) a coating of creamy consistency of waterproof adhesive substance, as rubber-base cement, from the container (*e*).

With its coating kept in a plastic, semi-liquid condition with heat from the unit (*g*), the fabric (*a*) receives from tongs (*h*) set singly or in series across its surface a great number of upstanding hairs in spaced relation. The latter, stuck endwise into the binder, are pressed by a roller (*i*) into the binder so that the hairs will incline in one direction, and they are in turn combed with a rotary brush (*j*) to remove tangles and to give them a fur-like finish. The hair-coated strip is then carried over the vulcanizing unit (*k*) and the plastic rubber composition on the ends of the hair is vulcanized, firmly fastening the filaments to the base, after which the finished strip is coiled on a roll (*d*). If desired, the fur may be cooled with air blasts from perforated pipes (*m*) and (*n*).

As stated, the primary purpose of the inventor is to produce in a cheap and continuous manner a material suitable for use as a substitute for fur and which may be cut up into a great variety of sizes, but it is conceivable that with the further improvement of the apparatus and the process the products may closely approximate in utility, appearance, etc., some of the most valuable pelts. He would employ either natural hairs, such as may be a by-product in the making of leather from natural

skins, or manufactured filaments resembling the hair of mammals and made by squirting viscose or similar cellulose solution. The hair used or the cement in which it is embedded may be suitably colored if desired; and if an upright fur is sought it

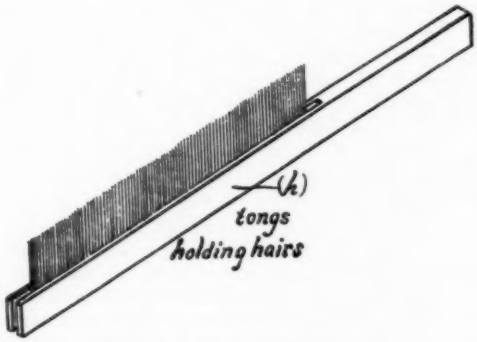


THE NOWELL RUBBER-SET FUR-MAKING MACHINE

can be produced by omitting roll (*i*) and brush (*j*). Other effects may be obtained by reversing the motion of the brush. All or some of the hairs may also be placed in tufts, either in all-over pattern or combination of long and short hairs; or the ground may be of one color and tufts of another, as ermine, leopard, and other fur.

According to the inventor, the binder, or semi-liquid adhesive material used for sticking the hairs on the base-fabric must, after vulcanizing, be perfectly pliable and must have rubber as its chief non-volatile constituent, the rubber being held in solution and spread upon the base-fabric either with a spreader, as already referred to, or with rollers or brushes, or by spraying or atomizing.

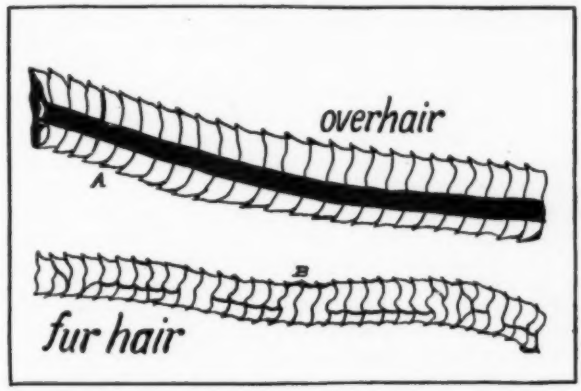
The microscope reveals the reason why hairs can be so well "rooted" in the rubber binding material in vulcanizing the latter. There is a great variety of animal hair, each kind as distinct as the species of animal from which it is taken, as experts know who make tests for spurious furs. Generally speaking, the outer coating of the hair of all mammals is made up of an infinite number of overlapping scales as shown in the accompanying illustration of one sort of wool hair, with a medullary or



TONGS FOR HOLDING HAIRS

pithy center that is especially discernible on the overhairs. The sharp, tiny edges of the scales get a grip on the vulcanizing substance that can not be equalled by any rounded, smooth-surfaced natural or manufactured filament, which fact has to be borne in mind in the production of artificial fur or wool hair on a commercial scale, a development probably of the not distant future.

A condition favoring the making of rubber-set furs, and which may lead to a considerable broadening of the artificial fur industry is the increasing scarcity of natural furs. So high an authority on wild animal life as William T. Hornaday, director of the New York Zoological Park, remarks in a recent bulletin, "The Fur Trade and the Wild Animals," issued by the New York Zoological Society, that present fur fashions, including summer furs, and the overtrapping and collecting of immature skins, stimulated by present high prices for furs, will mean the extinction of most of the wild animals of the United States by 1950. Other parts of the world may help some in supplying the deficiency in furs, but the chances are that the supply will not



ALPACA WOOL HAIRS (LARGELY MAGNIFIED)

A, OVER OR PROTECTION HAIRS, SHOWING MEDULLARY OR PITH SECTION
B, UNDER OR FUR HAIRS, SHOWING EPIDERMAL SCALE FORMATION

keep pace with the growth of population and prices will be steadily advancing.

LINCOLN HIGHWAY TO HAVE AN "IDEAL SECTION"

The great transcontinental roadway known as the Lincoln Highway is to have an "Ideal Section," and detailed surveys for this purpose are being made. The location to be finally fixed upon will probably be at a point in Lake County, Indiana, between Dyer and Schererville.

J. N. Gunn, president of both the Lincoln Highway Association and the United States Tire Co., and vice-president of the United States Rubber Co., recently investigated this district, and was pleased with the tentative location. Funds for carrying forward the work of building this ideal section are being made available by the United States Rubber Co. When completed the undertaking will represent the finest and most adequate work possible and in accordance with the best methods of scientific road construction.

FACTS REGARDING CORD TIRES

A 30 by 3½ cord tire contains almost 9,000 feet of cord or over a mile and a half. A 35 by 5 has over 30,000 feet of cord or over five and a half miles. The cord, similar to medium-weight fishing-line, is made of long-fiber cotton, of far better grade than used in ordinary cotton goods. Each cord, insulated in rubber, is separated from the next by a layer of rubber insulating which gives additional strength. A standard make 5-inch cord tire has 20 to 26 cords per inch and a strength in fabric carcass alone in excess of 2,400 pounds to the square inch, irrespective of the strength given by other parts.—*Miller News Service.*

Circular Looms for Weaving Tubular Fabrics[1]

CIRCULAR or tubular weaving is a manufacturing process conducted in mechanical rubber goods factories as well as in those devoted to the manufacture of cotton and linen fire hose only. A hose protected by a heavy woven jacket is proof against heavier bursting pressure and more severe external abuse than one not so protected. The method of circular weaving is employed in the manufacture, in continuous lengths, not only of fire hose, but of steam, air, garden, and suction hose, and as an outer cover to reinforce heavy-duty hose for various purposes.

A circular loom is a very compact and ingenious mechanism and the process of weaving is interesting and fascinating. The installation usually constitutes a distinct department in a rubber plant, with looms and creels set either on the same floor level, as seen in Fig. 1, or with looms on a gallery or mezzanine floor above the creels.

Two sizes of circular looms are manufactured, the larger having a range of output extending from the smallest diameters of fabric hose jacket up to eight inches, while the smaller has a capacity up to two inches in diameter. Within the limit of its capacity, either loom will weave hose jackets of varying fineness of weave, depending upon the yarn used and the number of picks of weft per inch. In each machine is a spacious central tubular column through the weaving center of which such articles as steam or air hose, electric cables, etc., may be passed for insulating or covering purposes. In a similar manner the outer jacket of double-jacket fire hose may be woven over the inner one in continuous lengths, one jacket being woven right-hand, and the other left-hand, to prevent twisting of the hose under pressure.

DESCRIPTION OF LOOM AND PARTS

The plan of a circular loom, and arrangement of its principal parts is approximately circular. A side view shows a heavy iron base plate with upright columns supporting a series of four circular platforms or galleries. The lowest platform carries a cam-actuated mechanism for operating the heddles, the second and third platforms carry the shuttles and shuttle guides, while the top plate completes the framework, supporting the take-off bridge, and protecting the operator from contact with the moving parts. All of the mechanism is arranged compactly and as near the base as possible to give stability, make the shuttle and weaving

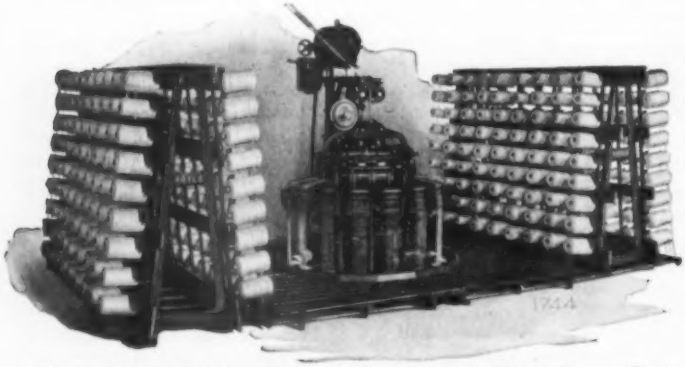


FIG. 1. CIRCULAR LOOM EQUIPPED WITH CREELS, MOTOR-DRIVE, TAKE-OFF ROLLS AND PRODUCTION INDICATOR, FOR WEAVING SMALL-DIAMETER HOSE

pin readily accessible to the operator, and bring the whole weaving operation into full view.

[1]The information and illustrations used in this article were obtained from John Royle & Sons, Paterson, New Jersey.

CAM-OPERATED HEDDLE MOTION

The sheds of warp are reversed at each heddle section in precise conformity with the travel of the shuttles around their circular track, through mechanism controlled by the action of a large horizontal cam revolving about the central axis of the loom in unison with the travel of the shuttles. On the under side of this cam a smoothly-machined channel engages, at each heddle section, a hardened-steel roller. Each roller is attached to a rack-and-pinion unit, which in turn operates a rocking-arm mechanism imparting the up-and-down motion to the two frames of its heddle section.

A distinctive feature of the heddle motion is its gentleness in opening the warp sheds. The sheds move rapidly at the middle of their travel, but start and stop very slowly, thereby avoiding shock to working parts, and preserving the original tensile strength of the warp yarn.

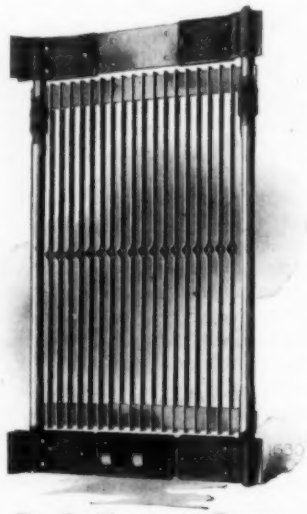


FIG. 2. HEDDLES IN FRAME

HEDDLES

Each warp thread enters the loom through the eye of a separate heddle and the number of warp threads that can be woven into a fabric jacket is limited by the number of heddles provided. Each heddle section comprises two rectangular metal frames, one inner and one outer—see Fig. 2—which are given an opposed up-and-down motion by the cam-operated mechanism described below. The warp is thus divided at each heddle section into two sheds which reverse their positions following the passage of one shuttle, and preceding the arrival of the other.

WARP TENSION EQUALIZER

The entire body of warp, after leaving the creels, is separated into 16 equal divisions corresponding to the number of heddle sections. At the base of the loom every thread is passed one or more times around a friction surfaced roll, one roll for each section of warp. These 16 rolls encircle the base of the machine and are suitably geared together to insure precise uniformity of rotation, thereby imparting even degree of tension and even rate of feed to all of the warp threads. A friction drum, geared to the train of rolls, permits the operator to control the tension of all the warp threads from a single adjusting device.

TAKE-UPS

After leaving the tension-equalizers the warp threads pass vertically upward through the take-up levers before entering the heddles. There is a take-up section for every heddle section, and each is a complete unit secured to the loom frame by a pivoted construction that permits its being dropped bodily downward from its normal position shown in Fig. 3, to that illustrated in Fig. 4. When a cop is to be renewed, two or more take-up sections are lowered, thereby slackening as many warp threads as may be necessary to permit easy withdrawal of the empty spindle, and insertion of the full cop.

After the new cop has been inserted the take-ups are reset to normal position, thereby restoring to the warp threads precisely the same degree of tension as before slackening. Each take-up section contains an equal number of spring-actuated levers, one for each warp thread, which compensate for the varying pull on the warp as the threads reverse and the shuttles pass between them.

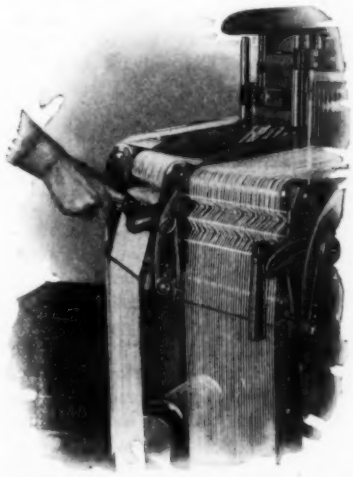


FIG. 3. TAKE-UP SECTION ABOUT TO BE LOWERED

SHUTTLES

There are two shuttles in the machine, each of which carries and delivers weft. They are mounted upon wheels, and travel around a leathered circular track, just inside the heddle enclosure, at diametrically opposite points on its circumference. Here they pass successively between the sheds of warp, which reverse, as to their upper and lower positions, after the passage of one shuttle and before the arrival of the other. Each shuttle carries a large, closely-wound cop of filling yarn, which passes in unwinding through a spring compensating device for maintaining uniform tension in the filling, or weft, as it enters the weave. Every revolution of each shuttle adds one complete layer or "pick" of weft to the fabric jacket being formed. For delivering weft from these compensating devices to the weaving point two hook-shaped "weft-guides" are used, one for each shuttle, each at its delivery end fitted closely around one-half of the weaving pin, and having on its inner face a groove of approximately the same sectional area as that of the weft being used. From each of these weft-guide grooves a strand of weft is continuously delivered into the forming fabric as long as the loom continues in operation.

The weft-guide grooves are cut spirally so that each layer or "pick" of weft delivered is pushed against the previous layer from beneath, thus clearing room for itself in the weave. In this manner the fabric tube is continually forced upward as fast as it is formed at the weaving point.

The action of these spiral-grooved weft guides is to pinch or nip the warp threads immediately below the weft at the instant the latter is interlaid, thus drawing them tight, and laying in the weft with sufficient pressure to force the preceding layer up and out of the way of the incoming one.

The shuttles in their circular travel are guided by two stationary comb-like circular fences placed one above the other in the stationary structure of the loom. The warp threads as they converge toward the weaving point pass through the pickets of these guide fences. The motion of the shuttles is always positive, uniform, and in precise harmony with that of the heddles.

WEAVING POINT

At the center of the loom an upright pin or core is mounted, about which the weave is formed. The outside diameter of this pin determines the inside diameter of the fabric tube, and for every required diameter of hose a weaving pin of corresponding size must be used. The fabric jacket is formed tightly around this pin. The tightness of weave can be varied to a considerable degree by the extent to which the weaving pin is made to project upward into the finished jacket, thereby increasing the amount of upward pressure required to insert each layer of weft.

When it is desired to weave a covering around steam or air hose, electrical cable, etc., or to make double jacket fire-hose, a tubular weaving pin is used, which diminishes in thickness to a very thin rim toward the weaving point. The article to be covered is passed upward through the central column of the machine and through the tubular weaving pin which serves as a guide, bringing it precisely to the center of the weaving point. As the newly-formed fabric is pushed up and off the outer circumference of the guider, it encloses the article being covered with a variable degree of tightness depending chiefly upon the vertical adjustment of the guider.

TAKE-OFF MECHANISM

When moderate flattening of the product is required as a convenience in coiling or in the case of a very loosely woven jacket, consideration must be given to keeping it clear from the loom as it passes the weaving point. To meet these requirements a pair of plain frictioned rollers are provided. These are readily separable and held in contact with the fabric by adjustable spring tension. The speed of the rollers is regulated by a train of change gears to conform to any variations in the rate of weaving.

Grooved take-off rolls are required for work which must pass through the rolls in tubular form. In such cases a pair of flanged iron hubs are furnished to be filled out with rubber compound to conform with the sectional area of the product.

CREELS

The unwinding of the yarn at its source is the starting point of uniform tension, hence the importance of properly designed, well-constructed creels. Viewed endwise, each creel resembles a narrow letter A, connected by wooden rails. On the slanting sides thus formed are fastened iron bars set with iron pins for holding the spools.

WEAVING FIXTURES

Certain interchangeable fixtures are used at the center of the loom to form the fabric, and to govern its size and density. These fixtures divide into two sets: those which remain stationary during the weaving process, and those which belong to and revolve with the shuttle.

The stationary division comprises the weaving pin, and the circular weft-guide supporter within which it is adjustably mounted. The pin is slidable vertically within the supporter, which in turn is supported by a ring threaded to the shuttle-supporting platform of the loom. The threaded connection of the ring provides a little vertical adjustment of the weft-guide support to compensate for the use of different thicknesses of warp, and for any slight lowering of the shuttles that may result from wear on the leathered shuttle track. The outside diameter of the pin determines the inside diameter of the fabric tube, and is of corresponding size. Likewise the pin must be a sliding fit within the support, so that for every diameter of jacket woven there must be a separate set of stationary fixtures used.

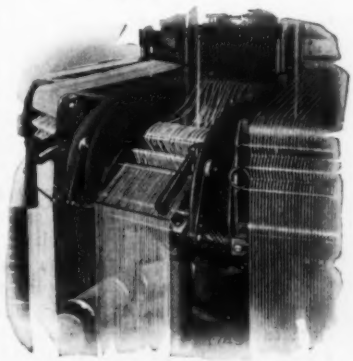


FIG. 4. TAKE-UP SECTION LOWERED TO SLACKEN TENSION OF WARP THREADS

The revolving division of fixtures comprises the spirally-channeled weft-guides which lay-in the weft threads, and the weft-guide holders which provide a connecting element between the weft-guides and the shuttles. Each shuttle requires one holder

and one weft-guide, and a different weft-guide is required for every change in the diameter of the fabric jacket, or in the number of picks (layers) of weft per inch of weave.

MOTOR-DRIVE

Standard motor-drive equipment is illustrated in Fig. 5 and comprises a motor and starter mounted upon a special elevated support which keeps them clear of dust and fluff. Pulleys are provided for the motor, and for the main driving shaft, together with a special endless belt. The motor is adjustable vertically upon its bracket through a sufficient range to provide for maintaining a suitable belt tension at all times. Experience has shown that for ordinary requirements, a five-horse-power motor affords ample power to operate the larger and a three horse-power motor to operate the smaller type of circular looms.

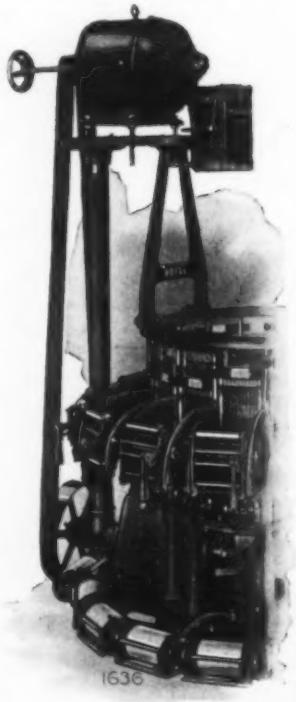


FIG. 5. VARIABLE-SPEED MOTOR-DRIVE

FRICTION CLUTCH AND BAND BRAKE

A friction clutch is contained within the main driving pulley for transmitting the power of the motor, and a band brake is attached to the vertical driving shaft of the loom just above its bevel gear connection. The same lever in its opposite motion releases the brake and throws in the clutch. The brake action will bring the loom instantly from full speed to a dead stop.

METHOD OF WEAVING

In a woven tubular fabric the "warp" constitutes the longitudinal element and the "weft" or "filling" the circular element. Fig. 1 shows the warp contained in the original spools or "cops" upon a supporting framework called the "creel." It is led from there to the "tension rolls" and "heddle" sections which encircle the outer edge of the loom. It is divided at the heddle sections into two "sheds" which converge toward the weaving point at the center of the loom.

The filling is delivered from two shuttles, each carrying a closely and specially wound cop of yarn. The two shuttles move at the same time around a circular track within the heddle structure, both traveling in the same direction at the same rate of speed, and at diametrically opposite points on the track. As the shuttles travel around their track, the two sheds of warp issuing from each heddle section are made to reverse their relative positions, vertically, during the interval between the passage of the shuttles. Thus there is continuous rising and falling of heddle sections, in succession, around the circumference of the loom and continuous circular travel of the shuttles as long as the loom is in operation.

The interlocking, or weaving, of the warp and weft into the form of a fabric tube takes place at the center of the loom, around a "weaving pin," or "guider" as the case may be, of diameter corresponding to the size of hose jacket required. As fast as it is woven the jacket is automatically delivered upward by the action of two semi-circular "weft guides," as they lay in the weft around the weaving pin. Final tensioning of the warp threads is concentrated at the weaving pin, and this is an important factor in securing a compact fabric.

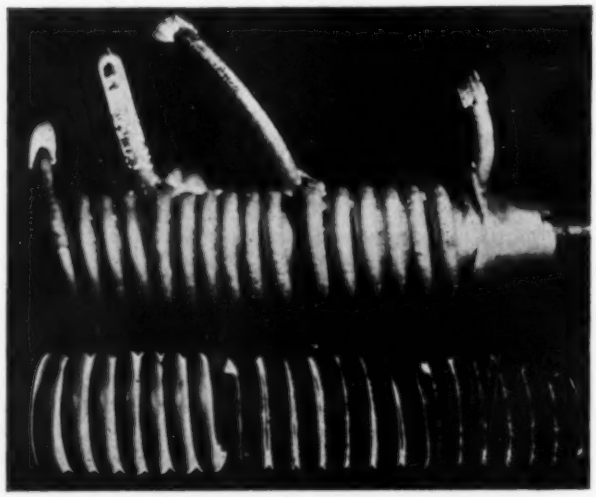
By using a tubular weaving pin or guider it is practicable to weave a fabric jacket around steam, air, or garden hose, flexible metallic tubing, electrical cable, etc., or to weave a second fabric jacket over one previously made with the usual type of solid weaving pin. The article to be covered is passed upward from beneath the loom, through the tubular central column, and the guider, and may be of unlimited length. The weaving operation is continuous so far as the length of product is concerned, but the loom must be stopped at intervals to replenish the supply of filling in the shuttles.

CRACKING OF RUBBER INSULATION ON IGNITION CABLES

In a recent issue of *Automotive Industries* the results are reported of an interesting series of experiments being conducted by the Bureau of Standards for the purpose of finding the causes of the cracking of rubber insulation of ignition cables.

It has been found that "the cracking at sharp bends, observed in the insulation of high tension ignition wires after service, is due to a chemical attack upon the rubber by the ozone of the electric discharge which takes place at the surface of the cable. This cracking does not occur if the insulating material is not under tension, or if the cable is surrounded by some medium other than air; but does occur even if the insulation is not subjected to electric stress, provided the atmosphere near the cable contains ozone. The extent of this cracking varies greatly with the insulating material used."

The conclusion reached is that the cracking can be materially reduced by using braided cable and by avoiding sharp bends.



CORONA ON IGNITION CABLES ON 1-INCH ARBOR

EXPOSURE TO CORONA ONLY FIFTEEN MINUTES AT 13,200 VOLTS A. C. AND TO ARTIFICIAL LIGHT 5 SECONDS TO SHOW LOCATION OF DISCHARGE
UPPER MANDREL FROM LEFT TO RIGHT: KERITE BARE, MINERAL RUBBER, KERITE UNCOVERED
LOWER MANDREL FROM LEFT TO RIGHT: KERITE BARE, KERITE COVERED, MINERAL RUBBER

The experiments referred to are fully described in Technical Note No. 32 of the National Advisory Committee for Aeronautics.

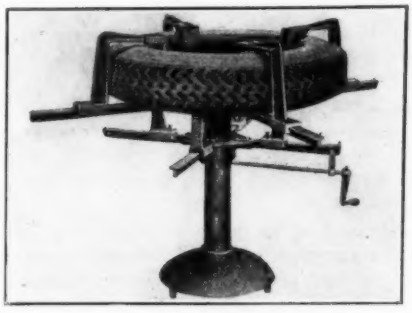
RUBBER BUTTONS FOR WASHABLE CLOTHING

H. Craven, manufacturers' agent, Southport, England, has patented a rubber button which is proving particularly satisfactory for underwear, pajamas, flannels, trousers, shirts and all other washable garments. It is made in all sizes and shapes—flat, round, domed, two and four-holes, shank, etc., of either stiff or soft rubber or rubber compound. These also are used as molds to be covered with fabric or other materials.

New Machines and Appliances

ADJUSTABLE TIRE SPREADER

A TIRE spreader of wide range of adjustability, built as a shop machine for the tire-renovating business, is shown in the illustration. It consists of a pedestal of convenient height, on which are mounted two sets of four horizontal guides or slides. The lower set of these is attached to a flanged collar around the pedestal and is movable vertically by means of a simple device operated by a handle as shown. Each set of guides carries slidable hooks for gripping the edges of the tire, four above and four below. With the hooks adjusted in the tire the spreader will quickly and easily spread open any automobile tire casing from the smallest to the largest size, permitting convenient inspection or repair.—Reichel & Drews, 452 North Ashland avenue, Chicago, Illinois.



THE R. & D. TIRE SPREADER

LIFTING TRUCK WHICH TURNS IN OWN LENGTH

The truck shown in the illustration is made of steel; the head being solid steel always remains rigid, thereby keeping the truck in alinement. There is no torsion strain or shearing action. The king-pin, a part of the fork holding the front wheels, has an internal oiling chamber which automatically lubricates the swivel, making turning of the truck smooth and easy, no matter how heavy the load. The king-pin also absorbs all vibration and shock. The single pedal of steel connects the lifting-hook and lever, and also releases the hook from its raised position.

The swivel turns partially or completely around when the truck is in raised or lowered position. The wheels are machine-faced and revolve on large roller bearings. The two front wheels of the truck are two inches in diameter, while the two rear are three inches. This four-wheel construction gives stability and allows the carrying of heavy loads without injury to the floor. The elevating cylinder walls are bored and ground to a high-grade machined finish, and no soft materials are used in its construction.

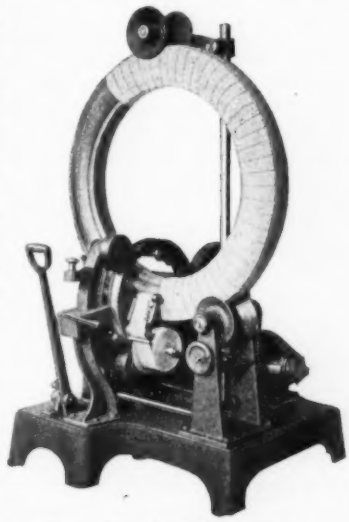
STUEBING LIFT TRUCK

The trucks have a carrying capacity of from 3,000 to 5,000 pounds, and take platforms from 25 by 22 inches minimum and 40 by 33 inches maximum for the smallest truck to 66 by 35 inches minimum and 86 by 44 inches maximum for the largest truck.—The Stuebing Truck Co., Cincinnati, Ohio.

SINGLE TIRE WRAPPING MACHINE

An ingenious device for paper wrapping individual tires has several unique features. Among these should be mentioned the fact that the following parts of this machine are made adjustable, in order to fit tires of varying sizes: shuttle for centering the different sizes of tires; feed rolls adjustable to any degree of overlap; paper folder to take in any width paper from 1½ to 3 inches; and adjustable tension.

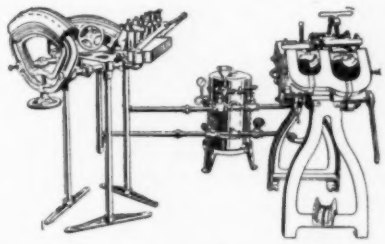
This machine, run by a one h.p. motor, is of simple construction, noiseless and compact, occupying a space only three feet square. It will fold any kind of paper, such as Kraft, crêped, asphaltum waterproof, and string-reinforced, while the guide-roll is so constructed that breakage of the paper is an impossibility. With a roll of paper 7½ inches outside diameter, and 1¼ inches core, 200 tires may be wrapped in an hour, or one tire in seven seconds.—Terkelsen Machine Co., 326 A street, Boston, Massachusetts.



PAPER WRAPPING MACHINE

NEW EXPANSIBLE TIRE REPAIR VULCANIZER

A specially designed equipment called by the makers a "super vulcanizer," is shown in the illustration. It consists, at the left, of a multiple tension inside vulcanizer for curing reliners or shoes inside of the casing, permitting application of heavy pressure and correct alinement and attachment to the casing. Next is shown the side wall and bead vulcanizer especially designed for air bag and hand-wheel pressure for curing side-wall and bead repairs of all passenger tires, both straight-side and clincher types. On the same stand there is a machined and polished tube plate which will cure repairs on four tubes at one time, each under pressure of an adjustable clamp.



"WESTERN" SUPER VULCANIZER

At the right of the illustration is shown a pair of sectional-casing vulcanizer mold cavities. These are built in split halves held together by bolts and nuts. This construction makes it easy to insert or remove casings. Spacers of quick heat-conducting metal of varying widths are inserted between the halves of the mold to expand or contract the cavities to fit any size of casing. Spacers of widths corresponding with those used be-

tween the halves of the mold are inserted between the bead plates to adjust them to the proper sizes. Long steel pressure bolts permit the use of a sand-bag and spring when curing spots on the tread and save the use of an air-bag for full sectional repairs.

The vulcanizers derive steam from a special high-power steel-riveted generator composed of ⅜ and ¼-inch metal and numerous tubular flues. It is equipped with all safety devices necessary to pass inspection requirements anywhere in the United States.—Western Rubber Mold Co., 243 North Crawford avenue, Chicago, Illinois.

CIRCULAR MANDRELS

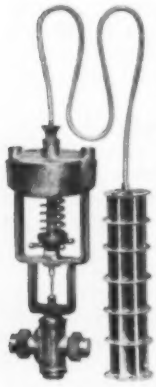
The advantage of circular mandrels for the manufacture of inner tubes is very evident from the fact that tubes so made fit the casing and are entirely free from buckling on the inner circumference, due to their annular form. The illustration pictures an inner-tube mandrel mounted on a holder or wrapping stand. The mandrel is made of 13-gage seamless drawn steel tubing, sherardized and highly polished as furnished ready for immediate use. Such tubes are made in regular sizes from 28 by 3 up to 37 by 5 and larger sizes to order.—Roessing Manufacturing Co., Sharpsburg Station, Pittsburgh, Pennsylvania.

CIRCULAR MANDREL AND STAND

RELIABLE TEMPERATURE REGULATOR

The illustration shows a temperature regulator known as the "Sylphon" for the automatic regulation of liquid or air temperature and can be used in practically every case where steam is the heating medium as in dry heaters or open-steam vulcanizers. The regulator is entirely self-contained, automatic, sensitive and accurate in regulation to a degree, and depends only upon the power generated within itself for operation.

It comprises a heat-sensitive bulb, which is inserted into the space or medium to be heated; a flexible tubing for connection of the bulb to the regulator; a motor chamber for multiplying the force developed in the bulb and transmitting it to the valve in the steam line; and an adjustable mechanism for setting the regulator at the desired temperature. The instrument is made in both lever and spring type of construction.—The Fulton Co., Knoxville, Tennessee.



SYLPHON REGULATOR

STAPLES FOR ELECTRIC WIRING

For quick and convenient attachment of telephone or bell wires in laboratory or factory, the insulated staples shown in the illustration are very desirable and useful. The fiber insulation effectually prevents troublesome short circuits and grounds.—Blake Signal & Manufacturing Co., Boston, Massachusetts.

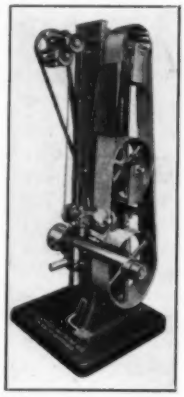
BLAKE INSULATED STAPLES

POLISHING AND FINISHING MACHINE

The illustration shows a duplex polishing and finishing machine adapted for finishing cylindrical objects in metal, fiber, rubber, wood, etc. The work in long or short lengths may be fed through the machine automatically by a power-feed attachment. Small articles of cylindrical form may be fed automatically through hopper fixtures.

The abrasive belt is 6 inches wide by 14 feet long, made endless, and is run over a cushion leather belt. It is this feature that gives the machine its remarkable efficiency as a light grinding, polishing, and finishing tool.

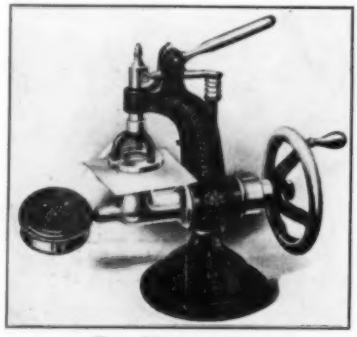
A machine of this sort should find an important place of usefulness as a means of keeping tube-poles clean and polished in a rubber tire factory where inner tubes are made.—Production Machine Co., Greenfield, Massachusetts.



MACHINE FOR POLISHING INNER-TUBE POLES

TESTING TIRE-BUNDLING PAPER

The Mullen tester is designed for determining the strength of paper by applying a hydraulic bursting pressure. The instrument is standard among paper manufacturers and dealers, and with the United States and various foreign governments. Its use is required by the revised tire-bundling specifications that were published in THE INDIA RUBBER WORLD, April 1, 1921.



THE MULLEN TESTER

The ordinary form of Mullen tester is shown in the illustration, and consists of a cylinder with a side opening over which the paper to be tested is clamped. By means of a hand-wheel hydraulic pressure is exerted upon the area exposed to test and the bursting pressure in pounds per square inch automatically indicated on a pressure gage. A rubber diaphragm is interposed between the paper under test and the liquid in the cylinder. The instrument is made in two sizes to cover a range of tests up to 1,000 pounds per square inch.—B. F. Perkins & Son, Inc., Holyoke, Massachusetts.

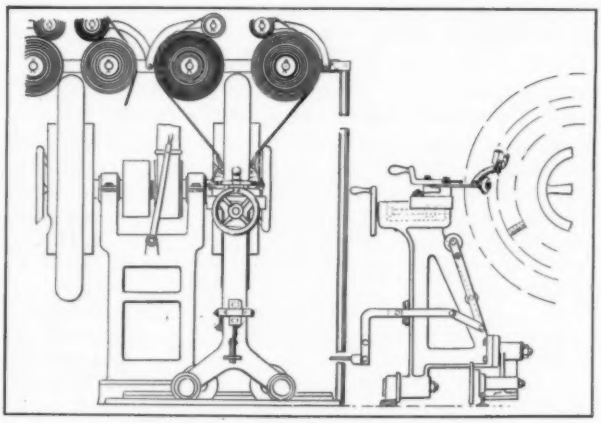
MACHINERY PATENTS

TIRE BUILDING MACHINE

A TIRE carcass is customarily built up by applying strips of rubberized fabric to the core, usually by hand. The invention shown in the accompanying illustrations eliminates unnecessary steps and effects the convenient and easy application of the chafing strips and side-walls.

The machine comprises a pedestal supporting a strip-applying device drawing material from rolls arranged on a frame above, and delivering it accurately positioned and rolled down on the carcass built on a revolving core. The strip-applying device is mounted on an independent support movable on wheels on a

track in front of the main structure, alternately serving either of two building cores.—The Goodyear Tire & Rubber Co., as-



MECHANICAL TIRE BUILDER

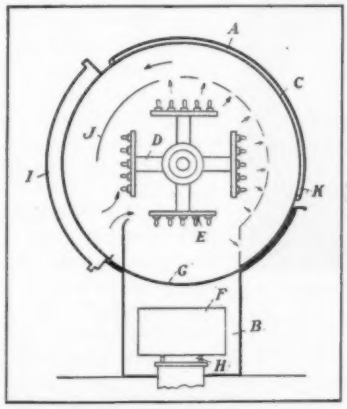
signee of William Bogart Harsel—both of Akron, Ohio. Canadian patent No. 210,429.

SPONGE RUBBER BALLS

Sponge rubber balls may be molded in two-part vented molds as follows: the rubber composition compounded to blow into a porous condition on heating is first formed in cylindrical shape by a tubing machine and cross-cut into sections of suitable length to reach across the diameter of the ball cavity. When so placed vertically, the mold is closed and vulcanizing heat applied, thus causing the cylindrical rubber stock to expand laterally. The air contained in the mold cavity escapes by the vents at either end of the cylinder of rubber and allows the latter to expand by becoming porous and filling out to the full spherical size of the cavity.—Charles F. Flemming, assignor to The Miller Rubber Co.—both of Akron, Ohio. United States patent No. 1,370,805.

MACHINE FOR DIPPING AND SOLVENT RECOVERY

In the dipping machine here illustrated, heating surfaces are arranged beside the cooling surfaces in the casing inclosing the mold carriers in such manner that the walls of the casing lying on the two sides of the mold carrier are given different degrees of temperature. There is thus obtained energetic circulation and intensive drying effect.



THE BOECLER DIPPING MACHINE

The solvent recovering device A is arranged above the dipping device B. The former comprises a casing C through which the revolving mold carrier D is journaled. The molds E on which the rubber articles are formed is arranged in series on D as indicated. In the lower part of A is an opening for the admission of dipping tank F closed by a slide G operated either by hand or power attachment. The encased dipping device B consists of tank F for the rubber solution, mounted on a hydraulic plunger H.

The left side of casing A is formed as a cooling mantle I, piped for the circulation of water. A guide baffle-plate J is attached to the casing and bent to run concentrically around the mold carrier D, and perforated where shown by the arrows for the escape of solvent vapors. The casing C of the recovery device A is provided on part of its circumference with a serpentine heating appliance K.

In operation the slide G is opened and the tank F raised to the dipping height to permit immersion of the series of molds E in rotation. The solvent vapor escapes rapidly in the circulation of warm air indicated by the arrows and condenses freely by contact with the water-cooled section and may be drawn off through an outlet pipe.—Albert Boecler, Malmö, Sweden. United States patent No. 1,380,862.

OTHER MACHINERY PATENTS

THE UNITED STATES

NO. 1,382,067 Collapsible tire core. T. Midgley, Sr., Worthington, O., assignor to The Fisk Rubber Co., Chicopee Falls, Mass.
1,382,035 Collapsible tire core. F. A. Watson, Springfield, O.
1,382,207 Apparatus for extruding, cooling, and cutting rubber. L. R. McGuire, assignor to the Firestone Tire & Rubber Co.—both of Akron, O.
1,382,471 Pneumatic-tire-building machine. J. L. Butler, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.
1,382,642 Rubber-heel trimmer. T. B. Huestis, assignor to National India Rubber Co.—both of Bristol, R. I.
1,382,651 Machine for trimming flashed edges of forked rubber binding. W. J. Kent, New York, N. Y., assignor to The Mechanical Rubber Co., a New Jersey corporation.
1,382,948 Vulcanizing oven. C. J. Berthel, Akron, O.
1,383,857 Mold for making heels, lifts, soles, etc., from rubber. H. C. Ridout, Bournemouth, England.
1,383,951 Repair vulcanizing device. S. J. Hurwitz, Youngstown, O.
1,384,362 Expansible core. J. Traum, Coshocton, O.
1,384,419 Apparatus for loosening tires from cores. A. O. Abbott, Jr., assignor to Morgan & Wright—both of Detroit, Mich.
1,384,431 Control for tire-stripping machine. M. Davis, assignor to Morgan & Wright—both of Detroit, Mich.
1,384,463 Tire-supporting device for tire molds. A. H. Harris, Barberton, assignor to E. A. Armstrong, Akron—both in Ohio.
1,384,503 Repair vulcanizer. W. R. Younger, Alexandria, La.

THE DOMINION OF CANADA

212,301 Apparatus for solutioning tire beads. The Dunlop Tire & Rubber Goods Co., Limited, assignee of T. A. Burns—both of Toronto, Ont.

THE UNITED KINGDOM

163,580 Control device for adjusting rollers of rubber-mixing, grinding or washing machine. Iddon Brothers, Limited, and H. E. Iddon, Brookfield Iron Works, Leyland, Lancashire.
163,781 Apparatus for covering endless wires for use in edges of tire casings. W. & A. Bates, Limited, and J. Healey, St. Mary's Mills, Leicester, and F. Shaw & Co., Limited, Corbett Street Ironworks, Bradford, Manchester.

NEW ZEALAND

43,276 Apparatus for manufacturing pneumatic tires. T. Sloper, Southgate, Devizes, Wiltshire, Eng.

GERMANY

DESIGN PATENTS ISSUED, WITH DATES OF ISSUE

778,110 (April 13, 1921) Vulcanizing apparatus. Josef and Paul Elsig, Merheimerstrasse 114, Köln Nippes.
782,033 (May 28, 1921) Electrically heated vulcanizing apparatus. Apparatebaugesellschaft m. b. H., Baden-Oos.
783,498 (May 31, 1921) Tool for making tire covers. Lorenz Schäfer, Königswall 50, Dortmund.
783,907 (May 31, 1921) Tool for making tire covers. Lorenz Schäfer, Königswall 50, Dortmund.

PROCESS PATENTS

THE UNITED STATES

NO. 1,382,208 Manufacture of articles of fabric and rubber. H. F. Maranville, assignor to the Firestone Tire & Rubber Co.—both of Akron, O.
1,382,367 Manufacture of tire carcasses. K. B. Kilborn, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O. (Original application divided.)

GERMANY

PATENTS ISSUED, WITH DATES OF ISSUE

339,810 (March 25, 1920) Method for improving pneumatic tires. Lucas Kinkel, Szeghegy-Bacska, Jugo-Slavia; represented by R. Fischer, Berlin, S. W.
339,811 (April 17, 1920) Attaching exchangeable rubber heels. Gustav Milse, a. d. Häfen 69, Bremen.
340,663 (November 14, 1920) Process for making treads. Walter Einert, Wolffstrasse 23, Hanover.

DESIGN PATENTS ISSUED WITH DATES OF ISSUE

782,458 (April 11, 1921) Attaching exchangeable rubber heels. Ludwig Stadler, Werftstrasse 5, Regensburg-Unterer Wöhrd.
782,887 (June 3, 1921) Process for obtaining non-slipping rubber heels. Ernst Wicek, Seumestrasse 83, Leipzig-Schleussig.
783,471 (September 20, 1920) Splicing tube ends for bicycles, automobiles, etc. Peter Müller, Fraulautern, Saar.
783,680 (June 10, 1921) Inflating tires. Oskar Klemm, Sternplatz 6, Berlin-Johannisthal.
783,763 (June 11, 1921) Coupling and uncoupling belting. Anton Stehlik, Vienna; represented by A. Elliot, Berlin, S. W. 48.
783,771 (June 13, 1921) Attaching rubber heels. Wilhelm Hayer, Schkeuditzerstrasse 22, Leipzig-Gohlis.

EFFECT OF LIMITED HOURS FOR WOMEN RUBBER WORKERS

LABOR laws regulating the employment of women in industry are becoming more general in the United States. Only five States—Iowa, New Mexico, Alabama, Florida, and West Virginia—do not regulate in any way the hours which women may work, while the 8-hour day is required for women in some or all branches of industry in eight states, one territory, and the District of Columbia. Whether the reduction in women's working hours means a corresponding decrease in production, an increase in cost of the finished article, or both, is the subject of a report lately submitted by the Women's Bureau of the United States Department of Labor.[1] The bureau made a survey of the conditions in rubber and other industries in New Jersey and Massachusetts and found that the factories had been keeping pace with the general trend throughout the United States to curtail the working time of women and advance their wages. Many factories have increased pay and decreased working time without waiting for legislative compulsion.

To offset reduced working time with the same or increased pay, enterprising factory managers have installed various labor-saving devices and have taken greater pains in eliminating waste and promoting efficiency. The manager of one rubber concern reported that in the 47-hour week, although the piece rates had not been increased, the piece workers earned as much as in the former 51-hour week, and the general output was better. A rubber hose manufacturer cited his experience where increased output followed fewer hours with a 10-minute rest period in every hour. Six girls on six machines were turning out on an average of 3,000 feet of hose a week, when it became necessary to turn out 25,000 feet a week. A night shift of men on the same machines failed as the men produced an inferior article. Two 8-hour shifts of women were then tried, with seven women to attend the six machines, instead of six who had worked 10 hours a day. The extra woman relieved each of the others during the 10-minute rest period at the end of each hour. The result was the surprising weekly average production of 32,000 feet of hose. Even though the machinery's speed had been increased from 40 to 74 revolutions a minute, it was figured that there was still a large gain to be credited to shorter shifts and the relief periods.

A Massachusetts belting manufacturer stated that in 1918 he had employed 28 women 52½ hours a week, paying them $8.87 a week. In October, 1919, he had 8 women 48 hours a week, paying them $14.12, and was actually doing more business than in 1918, and with fewer employes and women working shorter hours. One manufacturer frankly stated that on the lighter lines of work women not only produced a better article, but were steadier and more dependable, and that it paid to hire them even though their hours of work were more limited than those of men.

As relating to the proportionate number of women employed in rubber industries, a table is given showing the count made in fifteen factories in New Jersey in April and October, 1919. The total number of men employed in April was 6,771 and in October, 7,493. For the women in the same months the figures were 1,570 and 1,583. For the same months fifteen rubber establishments in Massachusetts give these figures: men, 14,670 and 16,008; women, 6,765 and 7,131; relative percentage of women for April, 31.6, and for October, 30.8. A great difference in the products of the two states, explains why the women in the rubber industry in Massachusetts number nearly one-third the total number of employes, while in New Jersey they are less than one-fifth. In the former state large quantities of light goods, such as rubber shoes, are produced; while in the latter state the rubber products are largely heavier articles, such as tires, hose, belting, etc., which can better be handled by men.

[1]Bulletin No. 15, of the Women's Bureau, U. S. Department of Labor, Washington, D. C.

The investigators say they found no desire on the part of employes or employers to revert to former conditions, one of the latter being quoted as saying that no manufacturer in his state would be willing to go back to the 54-hour week, and workers would rather take less pay.

WAGES PAID IN THE RUBBER INDUSTRY

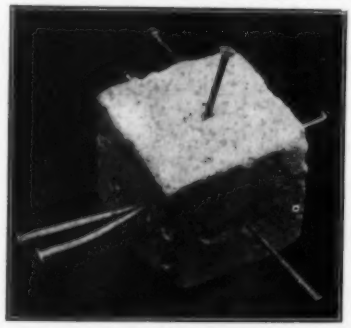
Statistics regarding wages paid to rubber factory employes in the United States have been recently compiled for the use of the Committee on Ways and Means, House of Representatives. Average weekly earnings of workers in New York State rubber factories during the month of October, for the year 1914, 1916, and 1918-1920 were, respectively, $10.63, $12.92, $18.19, $21.68, and $26.22.

From an industrial survey, conducted by the Labor Department, and covering 45 rubber establishments in the United States, employing both men and women, the following statistics regarding average hours and earnings per week, for the year 1919, were taken:

Occupation	Average Hours per Week	Average Earnings per Week
Tires and tubes		
Bead makers	48.6	$30.87
Bias-cutter operators	52.8	32.32
Builders or makers, hand	46.8	35.27
Builders or makers, machine	44.4	34.00
Operators, tubing machine (jacket and cover)	49.8	29.93
Ply cutters, tread cutters, and splicer preparers	47.4	29.14
Tube rollers, wrappers, and strippers	45.0	31.81
Vulcanizers	48.0	34.00
Wrappers, machine	57.6	38.18
Females		
Bead makers	49.2	18.58
Bias-cutter operators	50.4	23.57
Builders or makers, hand	47.4	24.90
Laborers and helpers	46.8	17.78
Tube rollers, wrappers, and strippers	44.4	20.31
Mechanical goods		
Belt makers	49.2	24.07
Laborers and helpers	52.8	21.09
Lathe men, buffers, and cutters	49.8	23.01
Makers, hand	48.0	24.97
Tube rollers, wrappers, and strippers	53.4	27.73
Wrappers, machine	46.2	24.07

TUFFITE AND TUFFINE NEW RUBBER MATERIALS

Tuffite is the pulverized product of tufa rock, first quarried at Mt. Angel, Oregon, for building purposes, but more recently found to be a useful filler for rubber compounds. The material is of volcanic origin and is a tuffaceous breccia, more commonly and properly called tuff. It is not a lava, but an ash of fragmentary composition, having been thrown up in some gigantic upheaval, falling like snow and in cooling and aging has solidified.



NAILS DRIVEN INTO TUFFITE HOLD FIRMLY

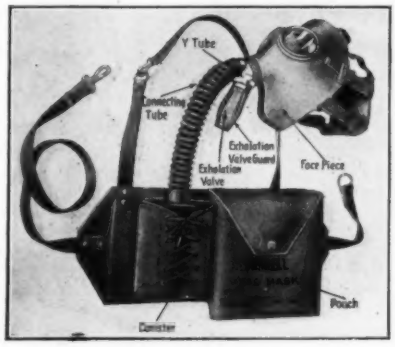
The rock is remarkably light, weighing only 80 pounds to the cubic foot. When pulverized it is soft and velvety and its specific gravity is 2.25. It is said to compound readily with rubber, producing a finished article that is tough, velvety, high heat resisting, light in weight and possessing a non-slip and non-skid value. It requires 3,100 degrees F. to melt the material and therefore has been found excellent as a rubber insulating material.

An accelerator marketed under the trade name "Tuffine," is being produced from the same material calcined and treated. Both Tuffite and Tuffine, it is said, are being used by several rubber companies on the Pacific Coast in the manufacture of tire treads and mechanical goods.

New Goods and Specialties

BUREAU OF MINES APPROVES GAS-MASK FOR AMMONIA FUMES

THE Burrell gas-mark, described in THE INDIA RUBBER WORLD, September 1, 1919, has been officially approved by the United States Bureau of Mines as an industrial gas mask suitable for the protection of those whose work in an atmosphere containing ammonia fumes makes necessary the wearing of a mask of this kind.



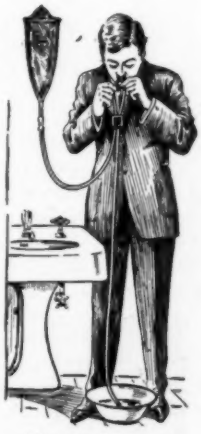
BURRELL MASK FOR AMMONIA FUMES

The face-piece and connecting tube are made of rubber covered with stockinette, and the exhalation valve and the deflector on the inside of the face-piece are also made of rubber. The head-bands and the bands used in assembling the different parts of the mask are rubber elastic. The accompanying illustration gives a good idea of the appearance of this mask and its accessories.—Mine Safety Appliances Co., 908 Chamber of Commerce Building, Pittsburgh, Pennsylvania.

NASAL SYPHON

The accompanying illustration shows the method of using the new Nichols nasal syphon which is designed to benefit sufferers from all inflammatory conditions of the nose, and to be used as a preventive sanitary device rather than as a curative means.

All parts of this syphon are made of rubber; the tubing and water-bag of soft rubber and the slide and nose-pieces of hard. The device operates by means of the suction force supplied by the outlet tube, which is in direct proportion to the perpendicular drop of the tube. This suction is induced by the creation of a partial vacuum in the head when both nostrils are stopped with the hard rubber perforated plugs.—Herbert B. Nichols, 145 East 35th street, New York, N. Y.



"NICHOLS" SYPHON

UNIQUE SUCTION-CUP SOLE

A new variation of the familiar suction-cup sole is found in the sole and heel of this rugged ball intended to withstand the hard wear and tear a strenuous boy will be likely to give it.

"CAMCO DUPLEX" SOLE

The particular feature of this shoe is the "Duplex" suction sole which is studded all over with double suction cups. The toe-cap, upper edge of vamp, eyelet pieces, and ankle patch are made of leather and serve to reinforce those parts of the shoe.—Cambridge Rubber Co., Cambridge, Massachusetts.

WINDSHIELD WIPER OF RUBBER AND FELT

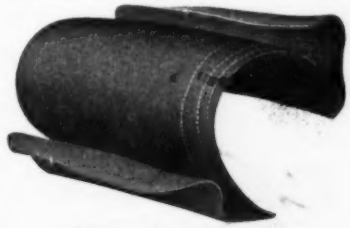
The stamp of approval of the Underwriters' Laboratories on a manufacturer's product carries with it to the public mind a certain weight of confidence. Among such products is the "Auto Scope" windshield wiper, shown herewith. It is of the sliding type that is adjusted on the top of the windshield and consists of a double squeegee rubber wiper for the exterior of the glass and a single felt wiper for the interior. This windshield wiper is considered standard by the Underwriters' Laboratories when installed on windshields adapted for its use.—White Products Co., 2204 Michigan avenue, Chicago, Illinois.

"AUTO SCOPE" WINDSHIELD WIPER

TWO NEW BLOWOUT PATCHES

The up-to-date automobilist may now choose between the colors of his blowout patches to go on either white or black tires. The one shown in the picture is intended for use on a black tire but its running mate is white, to harmonize with tires of white rubber, both patches being otherwise similar.

The new patch is made of high-grade fabric woven from long-staple combed cotton, saturated with pure rubber and not merely filled. The new feature of the patch is the red rubber tip designed with a feather edge to insure it remaining snugly against the casing without friction or creeping, and make the thickness less near the bead of the tire. All sizes of these patches except the three-inch have seven plies of fabric; the three-inch has six. — Firestone Tire & Rubber Co., Akron, Ohio.



FIRESTONE BLOWOUT PATCH

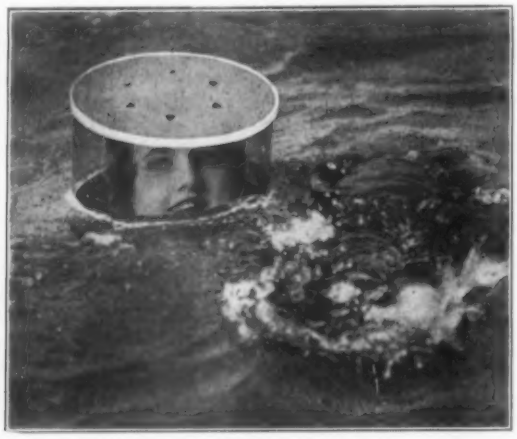
RUBBER OVERSHOE FOR CHILDREN'S "NATURE"-LAST SHOE

The production of shoes of special type and shape always makes necessary the manufacture of a similar shape of rubber overshoe, especially when the shoe is intended for children. What is said to be the only rubber overshoe manufactured in Canada for wear with the "Nature"-last shoe is shown in the accompanying picture, together with one of the shoes with which it is intended to be worn. It is heelless, of excellent-quality rubber.—Ames Holden McCready Limited, Montreal, Quebec, Canada.

"NATURE"-LAST OVERSHOE AND SHOE

DO YOU WEAR A COLLAR WHEN YOU SWIM?

It may sound as if more clothes were to be the fashion for swimmers when a collar for them is mentioned, but it is only a



SWIMMING COLLAR IN USE

device to keep the hair dry and at the same time buoy up the head and assist the timid bather. The swimming collar is shaped like a round box, with side part of celluloid and the top and bottom of rubberized fabric and elastic. The top has half a dozen small openings to admit air but does not easily admit water. The opening in the bottom just fits the neck and makes it watertight at that point. The entire weight is seven ounces, but the buoyancy power is ten pounds. A case of navy-blue fabric is provided for carrying the swimming collar to the beach, and the collar may also contain the bathing suit.—Swimming Collar Co., Inc., 2036 Ritner street, Philadelphia, Pennsylvania.

CLEANER FOR RUBBER STAMPS AND PADS

Anybody who has ever used rubber stamps knows how easily the type become clogged with a combination of ink and dust and also how soon the ink-pad becomes gummy and unsatisfactory for use. To remedy this condition, the "Scientific" stamp and pad cleaner combines in one a two-sided rubber brush inserted in a wooden handle. The toothed side cleans rubber type and the ribbed side removes the gummy deposit from stamp-pads.—H. S. Folger Estate, 409 South Clinton street, Chicago, Illinois.

RUBBER TO CLEAN RUBBER

KIT-BOX FOR MOTORISTS

For the convenience of the motorist who needs to make small repairs there has been placed on the market, with the intention of eliminating tire trouble entirely, a kit-box which contains every accessory needed in connection with a tire-valve.

TIRE-VALVE KIT-BOX

In addition to a box containing tire-valve inside parts, there is a set of "Kwik-On-An-Off" dust caps, a set of rim-nut bushings, five valve-caps, a valve-repair tool, a pump connection to permit testing the tire inflation without disconnecting the pump from the tire, a wrench for tightening hexagon nuts at the base of the valve-stem, and a "Schrader Universal" tire-pressure gage. The small box containing this kit is covered in imitation leather and makes a suitable gift for any motorist.—A. Schrader's Son, Inc., 783 Atlantic avenue, Brooklyn, New York.

A DOLL THAT WEEPS

A doll so human that it weeps at the whim of its owner will be sure to attract juvenile attention wherever this patented toy is displayed. Some moving-picture producer should also see the possibilities of this toy when used in juvenile films. If, for any reason, the weeping device no longer weeps, the outward appearance of the doll is not damaged in the least, contrary to the usual effect of tears.

Popular Science Monthly

THE "WEEPING" DOLL

The toy consists of a doll's head of celluloid, attachable to any body. The water reservoir within the head is fitted at the neck with a rubber stopper pierced by a rubber tube, as illustrated. The inner end extends slightly within the water reservoir. The outer end hangs down the doll's back and is closed with a stopper. The eyes have small holes at the inner corners, connecting with tiny water passages ending near the nose. Light pressure on the tube sends water up these passages and out of the eyes in tear-like drops.—George J. Hoefler, inventor; assigned to Mrs. K. Hoefler, 649 Van Duzer street, Stapleton, Staten Island, New York.

SLICKER BOOT AND RUBBER CONTAINER

The good-looking slicker boot shown here, with its convenient rubber container, adds an item to the man's outfit that should be found practical for motorcyclists, automobilists, or suburbanites. It is made with flexible black leg, reaching just below the knee, and a plain-edged sole. It fits over leather shoes and there is no heel. Only the style for men, made on one last, in one width in the various sizes, is provided with the neat rubber container.

"EXCEL BULLSEYE" SLICKER BOOT AND RUBBER CONTAINER

This boot is also made for misses, growing girls, and children, and is light in weight, fits well, and wears a long time.—Hood Rubber Products Co., Inc., Watertown, Massachusetts.

FOOTBALL SHOE WITH RUBBER SOLE AND CALKS

Now that the season for football contests is approaching, those who are interested in this game will appreciate the novel features of the football shoe illustrated here. It is not only practical but good-looking as well and should please the most fastidious player on the score of appearance.

RUBBER-SOLED FOOTBALL SHOE

The sole of this shoe is made of a composition containing rubber, which makes it impervious to water, no matter how wet the gridiron may be, while it will not soften or lose its shape when the ground is hard. The sole and cleats are molded in one piece by a patented process, so that the soles are pliable, but the cleats are harder and firmer than leather and have the added advantage of being integrally fastened to the sole. When worn down, however, they can be easily replaced. These soles are stitched on so there are no nails to hurt the feet.—Whitchell-Sheill Co., Brooklyn avenue and La Brosse street, Detroit, Michigan.

SUGAR-SERVER WITH RUBBER FOOT

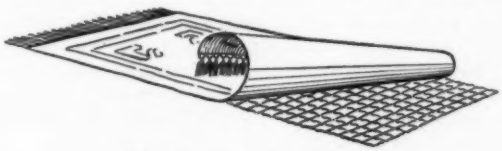
The "Spenlo" sugar-server is doubtless one of the economical devices evolved during those conservation days of war when public restaurants as well as private individuals were allowed to serve "only one teaspoonful of sugar per cup per meal," for it dispenses a teaspoonful at a tip. It is made of crystal glass with fluted sides, and has a top of heavily-nickeled copper. There is an automatic seal in the form of a ball-stopper which makes it entirely sanitary but does not in any way interfere with dispensing.

"SPENLO" SUGAR-SERVER

Lest it break or chip when it comes in contact with "Spotless Town" stoneware tables, or lest it scratch Madame's polished mahogany, there is provided a rubber foot, not shown in the picture.—Spengler-Loomis Manufacturing Co., 58 East Washington street, Chicago, Illinois.

USE RUG-LINER AND SLIP NO MORE

The man or woman who is fond of polished floors and handsome rugs and is expertly wary of their slipperiness will be glad to know about the patented "Worcester" non-slip rug-liner illustrated here. It is made of a net-like fabric, coated with pure rubber, and is fastened to the under side of the rug where it frictionally clings to the floor under pressure of the foot, thus



"WORCESTER" NON-SLIP RUG LINER

preventing slipping and providing a safe, unyielding surface on which to walk. It does not in any way change the appearance of the rug nor interfere with brushing or dusting.—Worcester Rubber Textile Co., 312 Park Building, Worcester, Massachusetts.

WOODEN PONY WITH RUBBER-CAPPED TAIL

Another use of rubber on the part of the toymakers is a rubber-tipped tail to a combined "teeter" and hobbyhorse. When the tail with the rubber tip is placed on the floor it is converted into a pony. As the child straddles it, and when the tail is in an upright position, the body slips forward in the seat and the toy moves along; then the tail falls into its original position again. This gives the same exciting sensation as though actually horseback riding.

THE "ROCKEY ROLLER"

Firmly fastening the tail to the rear axle with a chain results in a kiddie car, coaster or a scooter. Or the tail can be used as a handle to push the toy about, thus affording an unlimited amount of fun.

This combination toy is of hard wood, with solid wheels highly varnished and decorated a brilliant red. The spring seat instantly adjusts itself to the child's height and protects the tender little body from shocks. The steering drive is of indestructible metal and the rear axle is strong enough to support the weight of two children.—Ames-VanAken Manufacturing Company, Inc., Rome, New York.

HOPE FOR FAT ANKLES IN "PILLOW-WELT" BOOT

That "fashion is so much kinder to some women than to others," as a recent copy of a humorous publication indicated by a clever picture, is to be taken under advisement when it becomes a question of boots for women with fat ankles. This woman may now appear as carefully and smartly booted as her more-favored sister, while at the same time she is perfectly comfortable and can be assured that her boots are designed with special consideration for her particular needs.

"LADY DONGOLA" FAT-ANKLE BOOT WITH RUBBER HEEL

A Canadian manufacturer has produced the "Lady Dongola Pillow-Welt" fat-ankle boot, made with good quality dongola leather uppers, soles of 8 and 10-iron oak leather, fitted with special felt pillow cushions and high-grade rubber heels made by Gutta Percha & Rubber Limited, 357 St. James street, Montreal, Quebec. This boot is made in E, double EE, or triple EEE width, in Blucher, bal or button styles, with plain toe or tip, and either six or seven inches high.—Globe Shoe Limited, Terrebonne, Quebec, Canada.

The Plantation Rubber Crisis

THE world-wide industrial depression has brought about a most critical situation in the plantation rubber industry. The Rubber Growers' Association, London, and the International Association for Rubber Cultivation in the Netherlands Indies, The Hague, are endeavoring to make effective a plan to temporarily reduce production by 50 per cent, regulate the quantities, time and price of sales, and assist producers with loans.

PRODUCTION AND CONSUMPTION

Approximately 70 per cent of all rubber consumed in recent years has gone into tires. War requirements accelerated the development of motor transportation, and the post-war boom led everyone to believe that the peace requirements of the world were greater than has proved to be the case, partly because of the greater economy of peace over war uses, and also by the development of the cord tire, from which a much greater mileage is obtained than from the ordinary fabric tire. The new uses to which rubber is being put do not promise to increase materially the consumption in the immediate future. The stabilizing of the price of rubber would undoubtedly be beneficial in expediting manufacturing developments.

In 1914 the total rubber production of the world was 126,000 tons, of which 77,000 tons were plantation and 49,000 tons wild rubber. Unrestricted production in 1921 would amount to 360,000 tons of plantation and 30,000 tons of wild rubber. Existing plantations are capable of yielding at the rate of 500,000 tons per annum within a comparatively short time. Notwithstanding the voluntary restriction of output agreed to last fall, stocks of raw rubber in London and Liverpool have increased from 56,000 tons January 1, 1921, to 79,000 tons at the end of June, 1921.

The present world stocks of rubber are estimated to be about 300,000 tons, which figure includes all rubber on estates, in transit at port of shipment, afloat, in warehouses at ports of arrival in consuming countries, and in the hands of manufacturers. The stocks necessary for the normal working of the industry may be taken as seven months' consumption. At the present rate of consumption, 20,000 tons a month, such stocks would amount to about 150,000 tons. There would thus appear to be 150,000 tons of surplus rubber in existence.

PRINCIPAL FACTORS

With regard to the whole question of combination and control, the principal factors to keep in mind are: (1) the existing world stocks of 300,000 tons; (2) the potential 1922 output of over 400,000 tons; (3) the potential 1922 consumption, which is unlikely to exceed 250,000 tons; (4) the labor situation in the producing countries; (5) the vitality of the rubber tree which, after reaching maturity, remains a potential source of rubber, even though upkeep is entirely neglected.

As stated by the Dutch Commission appointed by the International Association for Rubber Cultivation, the huge supply of crude rubber hanging over the market, and the necessity, in which many producers are placed, of realizing on their product at any price, have depressed the prices of rubber to such a low level that practically every company is working at a loss. As a result producers who have not at their disposal the necessary financial resources are doomed to speedy ruin and their estates will gradually come into the hands of financially powerful groups for mere trifles. Continuation of the existing situation will entail considerable immediate money loss for shareholders and the industry will become entirely disorganized. Improvement in the price of rubber within a reasonable time is highly improbable, even with an improvement of the general economic situation. By means of drastic curtailment of production, a gradual diminishing of stocks will be effected.

SUCCESS DEPENDS ON COOPERATION

The plan outlined is believed to be a practicable method of achieving the desired rehabilitation of this great industry, but the task of securing the adhesion of 2,200,000 acres, about two-thirds of the existing planted area, the minimum deemed necessary to make the scheme effective, can be accomplished only by a spirit of cooperation. In arriving at this figure it is anticipated that no substantial acreage of native holdings can be brought into the proposed corporation. Owing to excessive tapping in the past the major portion of these holdings acre for acre is inferior in yielding power to the European owned estates, while their product is primitively prepared and not of standard quality. Only about one-half of the 2,200,000 acres is controlled in the United Kingdom, and the cooperation of the Dutch interests and of the principal local producers in the various Eastern countries is essential.

THE RUBBER PRODUCERS' CORPORATION, LIMITED

The plan proposed by the Rubber Growers' Association, London, is designed to combine the interests of all plantation rubber producers for the accomplishment of the following objects:

OBJECTS

The primary objects of the corporation are: (1) control of the rubber output of its members; (2) fix the selling price and regulate the sale of rubber produced by its members; (3) regulate the opening of further lands by its members; (4) purchase or make advances on the rubber harvested or to be harvested by its members; (5) if demand desirable, to make advances on security and on terms to be agreed upon to approved rubber estates belonging to its members.

The corporation will not exercise any functions in regard to the management or control of estates belonging to its members except in regard to the matters above mentioned.

CAPITAL

The nominal capital is placed at £2,000,000, in 2,000,000 shares of £1 each, with provision for borrowing up to £8,000,000, either by debentures or otherwise, of which a minimum of £3,000,000 is to be raised at once. The ordinary shares are to be allotted to members in the ratio of one share for each planted acre of rubber they possess.

MANAGEMENT

Control of the Corporation's affairs is to be in the hands of a court of directors, approximately one director for each 100,000 acres, a total of 21, of whom 18 represent estates and three the debenture holders. The executive board for carrying out the instructions of the court of directors will consist of four directors together with a manager and a secretary.

OUTPUT AND SALES

1. The output of rubber by members, including provision for young areas on their reaching maturity, will be regulated equitably by the court of directors and may be varied from time to time to meet market conditions.

2. The court of directors shall fix from time to time the prices at which the rubber controlled by the Corporation may be sold.

3. On all sales of rubber controlled by the Corporation there shall be paid to the Corporation a sum per pound to be fixed by the court of directors, which must be sufficient to enable the Corporation to pay the expenses of management, debenture interest and sinking fund, and accumulate funds at the credit of its several members as surety for the due fulfilment of their obligations to the Corporation. It is estimated that one penny per pound, together with interest on advances, will yield sufficient annual income for these purposes.

4. All rubber harvested by members will be consigned as at present and sold as authorized by the court of directors through the usual channels, the brokers being responsible for passing directly to the Corporation the charge referred to.

DIFFICULTIES AND OBJECTIONS

The statement is officially made that unless two-thirds of the planted area agree to come into the corporation, the latter will not be brought into existence. If the corporation does not eventuate and matters are allowed to take their course unguided, it seems clear that a large acreage of rubber will have to be abandoned or sold to the highest bidder. The object is to save the industry collectively, not to inflate the price of rubber in an unsound way.

The plan is opposed on the part of both British and Dutch interests on the ground that it will prove ineffective and temporary and that the universal law of supply and demand cannot be evaded by artificial means, one objector claiming the fatal defect of the scheme to be that the combine cannot effectually control supplies of crude rubber and its competitive substitutes (meaning rubber from estates not in the combine, wild rubber, reclaimed rubber, fillers and rubber substitutes), and, so far as it succeeds in raising prices it must stimulate all outside producers and competitors to greater production.

THE RUBBER CRISIS IN MALAYA

BANKRUPTCY IN SIGHT

THE danger that threatens the rank and file of the rubber planters in the Far East is very real and of vital interest to all users of rubber the world over. Cessation of tapping on the part of at least 25 per cent of the English, and all of the native plantations, spells a very general disaster. Nor is the way out at all plain at present. This is pictured to a degree in the following letter from an American resident in the Federated Malay States:

Things are in a terrible condition here as all movements of up-country rubber have ceased, destroying all business. We had the failure of 20 organized companies last year and many more private firms and failures have continued along steadily all this year, and the future looks much worse than anything we have had as yet.

It seems that the first requests for assistance to the Home Government by the Colonial Government were refused by Lord Churchill. We think that those requests were not properly arranged or worded and that the Government was ill advised, and possibly by certain strong financial interests who are looking forward to buying up all bankrupt properties in another nine months or a year. It would be a shame to make a monopoly of the several hundred plantation properties here. I very much fear that will be the outcome unless something is done at once. It is not for the interest of our rubber mills and importing firms to have all this rubber go into a monopoly controlled in London.

Along the same lines are the words of the correspondent of the *Financial Times*, London, cabled from Kuala Lumpur.

A year ago a man who had 50 acres of rubber in bearing was a rich man; today he is a pauper discarded by his bank and harassed by his creditors. Big firms which held stocks worth millions are still holding those stocks, now worth a fraction of their original price, and are tottering on the brink of bankruptcy. The Federated Malay States, which twelve months ago boasted of a surplus of over $100,000,000, has now been obliged to seek a loan of $15,000,000 from the Straits Settlements in order to carry out urgent public works. Those are the circumstances in which we now live, and until companies can be reconstructed to fit in with the altered conditions I cannot see any hope in the situation.

There are alleged to be in this country 1,250,000 acres of rubber in bearing, yielding something near 160,000 tons a year. No one can be dogmatic about these figures, because no one knows what the figures are. Fancy a country possessing such an important industry being ignorant of the most elementary statistics pertaining to it. That is only by the way. Theoretically the market price of rubber here is between 30 and 32 cents a pound, but even at that figure very few transactions take place. Formerly the average Malay villager tapped his dozen trees in the morning, brought the produce to the bazaar and got his dollar and his provisions for the day. Today his rubber can find no market, and he has no other means of subsistence, because long ago he had forsaken his natural avocation of agriculture for the more alluring prospects of rubber.

The planters here tried to bring home to their employers at home the seriousness of the position, and put forward a scheme the success of which depended a great deal on the assistance which the Home Government was prepared to give in its hour of need. But Mr. Winston Churchill, returning fresh from his pourparlers in the Mid East, turned down the scheme of compulsory restriction on grounds which, to my mind, appear to be rather weak and unreal; but, since Mr. Churchill's decision was communicated to this country, the rubber growers have been busy putting forward other schemes. There are six of these at present, including a new scheme which, I hear confidentially, the Rubber Growers' Association in London is now considering. The local schemes may be summarized as follows:

The Physick scheme proposed compulsory restriction to the extent of 50 per cent, and the method for the raising of the money required was by the industry subscribing one-half, the Government being asked to subscribe the other. The fund so raised was to be administered by a local body having powers conferred on it by the Government.

The Carey scheme, the main feature of which was to impose a tax on all rubber produced, the money so raised to be regarded as a loan from contributors which would bear appropriate interest and be loaned out to producers at a higher rate of interest. The scheme involves a measure of compulsory restriction, but it can be worked with that measure eliminated.

The Kelly-Smith scheme, aimed at restricting output by 50 per cent by imposing a heavy export duty on all excess over 50 per cent of the normal output, the duty not to exceed 10 per cent ad valorem, or 5 cents a pound of rubber. The scheme suggested that the Government should allow the free export of a certain proportion of the restricted output and impose taxes on any excess of that amount. Taking the present output of rubber at 160,000 tons a year, the Government revenue at present is next to nothing. If under this scheme the Government were to allow the export of 100,000 tons free of any duty, the balance of 60,000, at the rate of even 5 per cent, with the price at 30 cents a pound, would secure to the Government a revenue of $2,016,000. If the maximum price suggested was $1 a pound the revenue would be $6,720,000. But $1 is too high a price to calculate on. Taking the price at 80 cents, the revenue would be $5,500,000. The scheme, therefore, is more or less of a sporting nature.

The Straits Times scheme is fundamentally not very different from the Duncan Committee's scheme for compulsory restriction, which has been turned down, and I do not think that the Government will agree to it.

The main features of the Braddon scheme are: (1) the regulation of supplies; (2) the creation of an international rubber assurance association; (3) the election of a board to control the association by the rubber-growing industry in different countries of the world; (4) the association is to be a combine, but its methods of operations shall be above board; (5) to assure the success of the association a membership of 70 per cent of the total rubber area is considered sufficient; the association being designed primarily to protect the vested interests only of existing producers, its management and control will be entirely in their hands, but the cooperation of others is to be invited, especially those dependent on the industry—namely, present licensed local dealers in rubber, buyers on commission and buyers for consumption, who should be admitted as non-proprietary members; (6) the membership to be confined in the case of producers exporting their own rubber to those whose output is 10 tons or more annually, and among dealers to those whose dealings amount to the same quantity; (7) the conditions of membership are to be (a) to restrict output wholly or partially, as may be required by the association from time to time, (b) not to sell below the minimum price fixed by the committee, (c) not to sell to (or through) parties not belonging to the association, and (d) in the case of dealers, not to deal outside the association.

At present compulsory restriction of crop is the bugbear of the planting community, because it is feared that any scheme which contains even a touch of compulsion in it will not find favor.

ACCORDING TO THE CATALOG ISSUED BY THE O'NEIL TIRE & RUBBER CO., 350-354 Bowery street, Akron, Ohio, a complete line of the following products is carried by the company: vulcanizers; tire-repair equipment units; buffing stands; steam generators; air tanks and compressors; and repairmen's tools.

Chairman of the United States Rubber Co.

COLONEL SAMUEL POMEROY COLT, chairman of the board of directors and of the executive committee of the United States Rubber Co., New York, N. Y., died August 13 at his summer home, "Linden Place," Bristol, Rhode Island, aged 69, his death following a severe paralytic shock which he suffered eight days previously.

Lawyer, statesman, financier and manufacturer, Colonel Colt came of two of the most distinguished families of Connecticut and Rhode Island, and his own remarkable career upheld their best traditions. Not only was he socially prominent in New England, one of the captains of American industry and the outstanding figure of the rubber business, but he had been active in Rhode Island politics.

COLONEL SAMUEL POMEROY COLT

Born in Paterson, New Jersey, on January 10, 1852, he was the son of Christopher and Theodora De Wolf Colt, and the nephew and namesake of Samuel Colt, the inventor of Colt revolvers and founder of Colt's Patent Fire Arms Manufacturing Co., Hartford, Connecticut, the Colt family being among the early settlers of the latter city.

On the maternal side, he was the grandson of General George De Wolf and the grand-nephew of James De Wolf, who was United States Senator from Rhode Island in 1821. The De Wolfs were extensively engaged in the East and West Indies trade and in privateering during the early part of the last century and amassed a fortune. "Linden Place," a handsome old Colonial mansion on a great estate at Bristol, Rhode Island, erected in 1810 by General George De Wolf, was occupied as a summer home by Colonel Colt. There was preserved the old coach in which his great uncle, Senator James De Wolf, drove from Bristol to Washington, District of Columbia.

Another great-uncle, Henry Goodwin, of Newport, was Attorney General of Rhode Island from 1787 to 1789, while Colonel Colt's great-grandfather, William Bradford, was the sixth descendant of Governor William Bradford, second governor of the Plymouth Colony, Massachusetts, who came over in the "Mayflower."

Most of Colonel Colt's boyhood was spent in Hartford, Connecticut, where he received his early education, followed by a course in Anthon's Grammar School, New York, N. Y. Owing to his marked aptitude for business and taste for industrial pursuits he was sent to the Massachusetts Institute of Technology, Boston, Massachusetts, from which he was graduated in 1873. After a year of travel and study in Europe he entered Columbia Law School, New York, N. Y., graduating with distinction in 1876 and being admitted to the New York bar. The following year he began the practice of law in Providence, Rhode Island, where he soon had a lucrative clientele, including several large rubber companies.

Even before he became a lawyer Colonel Colt was interested in politics. In 1875 he was appointed aide-de-camp with the rank of colonel on the staff of Governor Henry Lippitt, of Rhode Island. In 1876 he was elected to a seat in the General Assembly, which he occupied for three years. From 1879 to 1881 he served as assistant attorney general and ably filled the office of attorney general from 1882 to 1885. He was also a member of the committee of fifteen appointed to revise the Rhode Island Constitution.

In 1887 he founded and was elected president of the Industrial Trust Co., of Providence, Rhode Island, now the second largest trust company in New England. Owing to serious illness in 1908 he resigned the presidency but continued with the institution as chairman of its board of directors.

It was also in 1887 that Colonel Colt entered, as a legal adviser and reorganizer, the field of rubber goods manufacture, of which he was to become the leading executive. The National India Rubber Co., Bristol, Rhode Island, was in bankruptcy, the factory had been closed and Colonel Colt was made president and treasurer. With a large plant, a past record of unfortunate business methods and owing its operatives ten month's wages, the company's future was not bright, and it was fully prophesied that the new president would gain experience but lose money in the venture. He took hold, however, with characteristic vigor and resource. While claiming no technical knowledge of rubber goods manufacture, he was in a financial sense fully at home in the management. Plant operations were begun again in April, 1888, and under his direction the business was soon put on a paying basis, regular dividends were declared, the stock was largely increased and a goodly surplus was accumulated.

Appreciating fully the opportunity presented when the formation of the United States Rubber Co. was projected, Colonel Colt was one of the first to throw his influence in favor of the plan of consolidation. Since the organization of that company in 1892 he has constantly been a member of the board of directors and executive committee, and he was its first legal adviser. Retaining the presidency of the National India Rubber Co., he later became head of various other constituent concerns, notably the Woonsocket Rubber Co., Goodyear's Metallic Rubber Shoe Co., and was later chairman of the board of directors of the Rubber Goods Manufacturing Co. and the United States Tire Co. He was also a director in numerous subsidiaries and important rubber companies affiliated with the United States Rubber Co., including the General Rubber Co., New York, N. Y.; Canadian Consolidated Rubber Co., Limited, Montreal, Canada; Holland-American Plantations Co., Netherlands-Langkat Rubber Co., and United States Rubber Plantations, Inc. In all, he was a director in some forty corporations, including banks, railroads, steamship and manufacturing companies, most of them, however, directly or indirectly connected with the rubber industry.

In 1896 he was elected secretary of the United States Rubber Co., which position he held until 1901, when he was elected president, succeeding Frederick M. Shepard of East Orange, New Jersey. From then until his death he was the guiding genius of the world's greatest rubber company. He built up a strong organization over which he exercised remarkable harmonizing influence, but which he did not dominate to the extent of abrogating to himself powers and prerogatives belonging to his officers. He gave them wide scope in the management of their departments.

Under his able leadership the combine grew and prospered. From a $50,000,000 company doing an annual business of only $25,000,000 the business was so expanded that the last annual report showed a total capital stock of $146,277,200; assets and liabilities, $389,252,696; business for the year 1920, $256,150,130. Meanwhile the operations of the company had embraced, in addition to the manufacture of rubber goods, the growing of crude rubber, reclaiming of scrap rubber, weaving of cotton fabrics and the supply of other allied materials, while the product of its forty-seven factories and numerous subsidiaries in many states and employing more than 20,000 persons, had been extended to include nearly everything made of rubber, and was marketed by branches throughout the world.

For nearly eighteen years Colonel Colt continued in the presidency, until in 1918, in order to relieve him somewhat from many onerous duties, and that he might devote himself exclusively to direction of the firm's financial policy and to special work for the benefit of the company, he was elected chairman of the board of directors, Charles B. Seger succeeding him as president.

Throughout this period his duties as active head of the greatest rubber concern in the world left him little time for outside interests, although in 1903, against his wish, he was persuaded to accept the Republican nomination for governor of Rhode Island, but was defeated, Governor Garvin being reelected by a majority of only 1587 votes. Again in 1908 his name was placed in nomination before the Rhode Island Legislature for United States senator, but he withdrew his candidacy.

Colonel Colt's ample personal fortune permitted him to indulge in many generous acts. Bristol, Rhode Island, wanted a high school and he presented to the town the Colt Memorial, a handsome white marble structure, as a free gift, a memorial to his mother, which, with the site, entailed a cost of about $150,000. He acquired the 300-acre farm on Popasquash Neck, a peninsula jutting out into Narragansett Bay, which he converted into a beautiful park, placed in it valuable works of art in marble and bronze, erected a big tower as a free observatory, and threw it open to the public.

When President Faunce of Brown University, Providence, Rhode Island, announced his desire for a memorial library to John Hay, the distinguished alumnus of that college, Colonel Colt immediately sent a contribution of $10,000 to start the fund. He also purchased a large part of Mt. Hope, overlooking Mt. Hope Bay and Fall River, one of the historic spots of Rhode Island in connection with the Indian War, with the intention of making it a public park. His donations to the Actors' Fund of America and numerous other charities were generous and unheralded.

Colonel Colt was married in 1881 to Elizabeth M. Bullock, of Bristol, Rhode Island, daughter of J. Russell Bullock, former judge of the Supreme and the United States District courts of Rhode Island. She survives him, as do his two sons, Russell Griswold Colt, of H. L. Horton & Co., stock brokers, New York, N. Y., who married Ethel Barrymore, the actress, in 1909, and Roswell Christopher Colt, assistant secretary and director of the Canadian Consolidated Rubber Co., Limited, Montreal, Canada; also his brother, United States Senator Le Baron Bradford Colt, formerly judge of the United States Circuit Court.

He was a member of the Metropolitan, Athletic, Republican, Lawyer's and East Indian clubs of New York, N. Y., and of the Squantum, Hope, University and Country clubs of Providence, Rhode Island; also of the Rubber Association of America and the National Foreign Council.

The funeral was held from "Linden Place," Bristol, Rhode Island, August 16. In attendance were executive officials of the United States Rubber Co. in a body, representatives of the rubber industry and trade organizations, and many friends prominent in public life. Out of respect to his memory the general offices of the United States Rubber Co. were closed all day, and all branches at 3 o'clock.

In the passing of Colonel Colt his associates have individually lost a good friend, his company an able and conscientious executive, and the rubber industry its most distinguished leader. Personally an exceedingly pleasant man to meet, very popular socially, carrying his honors easily, having the rare faculty of combining unvarying courtesy with commercial dispatch, and manifesting unfailing kindness toward those around him, he held the respect, trust and esteem of his business associates and the warm friendship of many men in all walks of life here and abroad.

THE EDITOR'S BOOK TABLE

"THE DISEASES AND PESTS OF THE RUBBER TREE." BY T. Petch, botanist and mycologist to the Government of Ceylon. Macmillan & Co., Limited, St. Martin's street, London, England. Cloth, 278 pages, 6 by 9 inches.

SINCE the publication, in 1911, of the author's former volume, "The Physiology and Diseases of Hevea Brasiliensis," the investigations since made, warrant the publication of certain data. Tree surgery, for instance, has received much attention in very recent years, and has made wonderful advances in its particular province. Recent developments in this science have been studied by the rubber planter with encouraging results. Preventive measures generally instead of remedial, and various new ideas in regard to sanitation, have not been neglected. Some of the results of such studies have been embodied in the present volume.

Its value has been also enhanced by many excellent illustrations, while a brief summary of the diseases described, with references to these illustrations, has been added to each of the principal chapters. An extended bibliography, which includes the more important papers which have been published on the subject since the beginning of the plantation rubber industry, concludes the volume.

"BROWN BAST—AN INVESTIGATION INTO ITS CAUSES AND Methods of Treatment." By A. R. Sanderson, F. L. S., and H. Sutcliffe, A.R.C.Sc., F.R.M.S., mycologists to the Rubber Growers' Association (Malaya Research Branch). Rubber Growers' Association, Inc., 38 Eastcheap, London, E. C. 3,, England. 1921. Cloth, 71 pages, 6 by 10 inches.

In the volume under consideration the authors hold, as do other investigators, that the disease of brown bast is physiological, and is due to the operation of tapping. The frequency of tapping, the age of the tree, and its susceptibility to disease, must all be considered in outlining any course of treatment. The authors describe a number of cases where brown bast has occurred, and illustrate their subject with many photographs. Their field observations have covered many parts of the Malay Peninsula, Ceylon, and India.

The conclusion reached is that stripping, properly carried out, is both the easiest, most effective, and least expensive of remedies. There is need of good judgment, however, in entering upon this procedure, which, although drastic, is the only form of treatment that is likely to be generally effective.

The book contains an appendix dealing with the subject of "dry" trees, in which the details and significance of the incidence of this symptom are considered.

"CHEMICAL TECHNOLOGY AND ANALYSIS OF OILS, FATS, and Waxes." By Dr. J. Lewkowitsch, late consulting and analytical chemist. Macmillan & Co., Limited, St. Martin's street, London, England. 1921. Three volumes. Sixth edition, Volume 1, cloth, 682 pages, 6 by 9 inches.

The first volume of the sixth edition of a work, originally published, in 1895, in three volumes, has recently appeared. "Chemical Technology and Analysis of Oils, Fats, and Waxes" by Dr. Lewkowitsch, is a standard publication, exhaustive in treatment, and broad in its scope. This sixth edition, published since the death of the author, has been carefully edited, rewritten and enlarged by George H. Warburton, who was long associated with Dr. Lewkowitsch in his analytical practice. Mr. Warburton notes the progress made by scientific investigators in their studies of

oils and fats since the publications of former editions of this well-known work. He calls attention to the world's shortage of animal fats, and writes in his preface that the discoveries made along these lines are naturally regarded as valuable secrets, and are, therefore, unfortunately not published. "Statistics of production, imports, and exports under the heading of individual oils and fats are presented in as complete a fashion as possible, but it should be borne in mind that since 1914 the position has been abnormal and the figures given cannot, therefore, be accepted as indicative of what the outlook will be in the near future."

The two remaining volumes of "Chemical Technology and Analysis of Oils, Fats and Waxes" will be published during the year.

"DEVELOPMENTS IN INDUSTRIAL TECHNOLOGY." McGraw-Hill Co., Inc., New York, N. Y., 1921. Paper covers, 124 pages.

This is a reprint of 29 papers selected from *Chemical & Metallurgical Engineering*, in which the authors ably discuss many interesting phases of industrial technology. The only paper on a rubber topic is that by G. D. Kratz and A. H. Flower, entitled, "Effect of Certain Accelerators Upon the Properties of Vulcanized Rubber," and was read before the New Jersey Chemical Society, January 13, 1919.

"STANDARD COTTON MILL PRACTICE AND EQUIPMENT." Compiled and edited by Alston Hill Garside, Statistician of the National Association of Cotton Manufacturers. Boston, Massachusetts. Cloth, 177 pages, 6 by 9 inches.

Through the publication of this volume, the 1921 year-book of the National Association of Cotton Manufacturers, certain statistics are collected which are of value to the cotton industry. By means of tables, charts, and diagrams, conditions prevailing in the cotton trade generally during recent years, not only in the United States, but also in England, India, China, and Japan, are clearly indicated. An attached leaflet states that on account of the broadened scope of the publication, the name will be changed, beginning next year, to "Cotton Manufacturers' Manual."

INTERESTING LETTERS FROM OUR READERS

FROM A EUROPEAN BUSINESS MAN

TO THE EDITOR:

DEAR SIR: You will perhaps remember that I had the pleasure of calling on you several months ago when you were good enough to be of considerable assistance to me.

What I want to point out at this time is, that although American rubber manufacturers are understood to be anxious to develop foreign markets, we still find ourselves in a position of inquiry, and they seem to have little interest in offering their goods to ready buyers.

Although the writer makes a yearly trip to America, and is contemplating further trips in the near future, he is amazed at the difficulty of finding the most suitable makers for any given line, and it always seems that in spite of considerable activity on your side, more remains to be done on return than during a buying visit.

London, England. ENGLISH BUYER.

TIRE DEALERS ASSOCIATION OF PHILADELPHIA

In an endeavor to advance the interests of the rubber tire industry several Pennsylvania firms united last May in the formation of the Tire Dealers Association of Philadelphia. At the present time the association numbers sixteen well-known Philadelphia dealers, but it is hoped that the membership will be greatly increased in the near future. The officers are: president, J. J. Bradburn, Atlantic Tire & Rubber Co.; vice-president, Herbert Buxbaum, Paramount Double Tire Co.; treasurer, S. Levy, Philadelphia Rubber Tire Co.; secretary, Albert W. Stellwag, 716 North Broad street, Philadelphia, Pennsylvania.

RUBBER TRADE INQUIRIES

THE inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(902) A correspondent desires the addresses of foreign rubber-bulb manufacturers.

(903) An English correspondent desires to purchase glazed hollands.

(904) A manufacturer desires to purchase printing ink and coloring for stamping toy balloons.

(905) We are asked where to obtain "Arestic," a very bright red coloring material.

(906) Inquiry is made for information concerning caoutchouc oil.

(907) A correspondent desires to secure the agency for the best cellular or sponge rubber substitute for inner tubes.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Requests for each address should be on a separate sheet and state number.

DISTRICT OFFICES.	COOPERATIVE OFFICES.
New York: 734 Customhouse.	Cleveland: Chamber of Commerce.
Boston: 1801 Customhouse.	Cincinnati: Chamber of Commerce; General Freight Agent, Southern Railway, 96 Ingalls Building.
Chicago: 504 Federal Building	
St. Louis: 402 Third National Bank Building.	Dayton, Ohio: Dayton Chamber of Commerce.
New Orleans: 1020 Hibernia Bank Building.	Los Angeles: Chamber of Commerce.
San Francisco: 307 Customhouse.	Philadelphia: Chamber of Commerce.
Seattle: 848 Henry Building.	Portland, Oregon: Chamber of Commerce.

(35,159) A merchant in Germany desires to represent American manufacturers for the sale of colors, asbestos, bicycle and automobile accessories, etc.

(35,163) An engineering company in Palestine desires to purchase and secure an agency for the sale of automobile, motorcycle, and bicycle tires, tubes and accessories. Quote c. i. f. Palestine port. Payment against documents.

(35,236) A mercantile firm in South Africa desires to purchase retread bands, cushion gum, tread gum, building fabric, bead fabric, and breaker canvas, for monthly shipment. Catalogs, export prices, and samples requested.

(35,247) A county engineer of a municipality in Norway desires to purchase a complete equipment for sand and gravel pits, especially conveyors and conveyor belting. Quote c. i. f. Norwegian port, or f. o. b. Atlantic port.

(35,261) A manufacturer's agent in Ireland desires the agency for the sale of rubber surgical goods and druggists' sundries. Quote c. i. f. Irish port.

(35,279) A firm in Ceylon desires to have manufactured in the United States rubber-tapping knives like samples to be furnished. Quote c. i. f. Ceylon port. Payment against documents, through bank.

(35,289) A mercantile firm in Denmark desires the agency, on commission basis, for the sale of medical rubber goods and American novelties of all kinds. Quote c. i. f. Danish port or f. o. b. New York. Payment on arrival of goods in Denmark.

(35,323) A manufacturing company in Ireland desires to purchase, in wholesale quantities, first-class rubber matting and tires for coaches. Quote c. i. f. Waterford.

(35,316) A firm in England desires to communicate with manufacturers of chemicals and machinery used by rubber manufacturers.

(35,324) An importing firm in Sweden desires to secure representation of a manufacturer of automobile tires.

News of the American Rubber Industry

FINANCIAL NOTES

THE FISK, FEDERAL AND NINIGRET MERGER PROPOSES IMPORTANT CHANGES

A PROPOSED readjustment in its capital stock, and the acquisition of the properties of the Federal Rubber Co., and the Ninigret Co., are being considered by The Fisk Rubber Co. Because of the decline in the market values of rubber and cotton fabric which meant that finished stock was written down to a new basis of twenty cents a pound for rubber and a corresponding basis for fabric, the balance sheets of Fisk and Federal show a deficit instead of a surplus. Costs, however, are now being figured on the new basis whereby the companies can readily meet competition based on present market values. In fact, on this basis the business is showing normal profits during the current quarter. Orders and sales of Fisk tires are close to the maximum level, while production is nearing capacity. The Federal is also showing greater activity, while the prospects of a continuance of business are most encouraging. It has been considered desirable for the Fisk company to acquire the assets of both the Federal and Ninigret companies, thus enabling a direct mortgage to be given on all properties.

The Fisk company proposes to issue $10,000,000 20-year mortgage bonds and to increase the authorized amount of the first and second preferred stocks and the common stock as decided by the proxy committees. An option may be given for 10 years on 50,000 shares of common stock at $5 a share to facilitate the sale of the bonds or second preferred stock or common stock, or both may be otherwise sold or disposed of on option given at such prices and on such terms as the proxy committees shall approve.

First preferred Federal shareholders will receive Fisk first preferred share for share and 58⅓ cents a share as a dividend adjustment, dividends on the Fisk stock to cumulate from May 1, 1921. A similar exchange is offered for the Fisk second preferred, with the Fisk dividend to cumulate from June 1. Federal common stockholders are to receive share for share of Fisk common. Ninigret common shareholders are to receive Fisk common stock as Fisk directors decide.

REPUBLIC PROTECTIVE COMMITTEES

The protective committee for the first preferred stock of the Republic Rubber Corporation, Youngstown, Ohio, consists of H. M. Geiger, The Geiger-Jones Co., Canton, Ohio; Fred S. Borton, Borton & Borton, Cleveland, Ohio; Wilford P. Arms, The Realty Guarantee & Trust Co., Youngstown, Ohio; and Richard Brown, secretary, The Realty Guarantee & Trust Co. The protective committee for the second preferred and common stock consists of W. S. Banks, D. W. Myers and Phillip H. Schaff. C. W. Ullman, Dollar Savings & Trust Co., Youngstown, Ohio, is secretary.

GOODYEAR TIRE & RUBBER CO. OF CANADA, LIMITED

Encouraging indications of present and continued prosperity are evidenced by the recent report of the Goodyear Tire & Rubber Co. of Canada, Limited. The debt of $2,826,000 to the parent company, The Goodyear Tire & Rubber Co., Akron, Ohio, has been liquidated by allotting it at par 28,260 shares of 6 per cent prior preference stock, while satisfactory arrangements have also been made with fabric and rubber commitment creditors.

The Canadian company's surplus now amounts to $2,833,458.28, which will be held available, and is more than ample to meet the excess cost of all materials contracted for but undelivered. June operations showed a net profit of $92,253.39.

At the special general meeting of the shareholders of the company, held July 18, 1921, the following officers were elected: E. G. Wilmer, president; C. H. Carlisle, vice-president and general manager; J. G. Lane, treasurer; H. N. Barry, secretary; R. P. D. Graham, assistant treasurer; R. C. Berkinshaw, assistant secretary; H. C. Lower, general sales manager; E. H. Koken, factory superintendent.

The newly-elected board of directors includes the following: E. G. Wilmer, C. H. Carlisle, G. M. Stadelman, P. W. Litchfield, J. E. McAllister, P. A. Thomson, J. G. Lane.

DIVIDENDS DECLARED

The Firestone Tire & Rubber Co., Akron, Ohio, declared its regular quarterly dividend of one and three-quarters per cent on preferred stock of record August 1, payable August 15, 1921.

The B. F. Goodrich Co., Akron, Ohio, has declared the regular quarterly dividend of one and three-quarters per cent on preferred stock of record September 21, payable October 1, 1921.

The Hood Rubber Co., Watertown, Massachusetts, has declared its regular quarterly dividend of one and three-quarters per cent on preferred stock of record August 2, payable September 1, 1921.

The Lee Rubber & Tire Corporation, Conshohocken, Pennsylvania, has declared its quarterly dividend of fifty cents a share on common stock of record August 15, payable September 1, 1921.

NEW YORK STOCK EXCHANGE QUOTATIONS

AUGUST 22, 1921

	High	Low	Last
Fisk Rubber Co., The	9	9	9
B. F. Goodrich Co., The	30½	29¾	29¾
Kelly-Springfield Tire Co.	36½	35¼	35½
Keystone T. & R. Co., Inc., The	12¾	12	12
Lee R. & T. Corporation	24⅛	24¼	24¼
United States Rubber Co.	46⅛	45⅛	45⅛
United States Rubber Co., 1st pfd.	86	85¾	85¾

AKRON RUBBER STOCK QUOTATIONS

The following are closing quotations of August 17, supplied by The App-Hillman Co., Second National Building, Akron, Ohio:

	Bid	Asked
American R. & T. Co., com.	30	40
Amazon Rubber Co., The	..	15
Firestone T. & R. Co., com.	60	62
Firestone T. & R. Co., 6% pfd.	80	85
Firestone T. & R. Co., 7% pfd.	70	71
General T. & R. Co., The, com.	..	200
General T. & R. Co., The, 7% pfd.	75	78
Goodrich, B. F., Co., The, com.	30	31
Goodrich, B. F., Co., The, pfd.	70	75
Goodrich, B. F., Co., The, 5-yr. 7% notes	90	91
Goodyear T. & R. Co., The, com.	11	11¼
Goodyear T. & R. Co., The, 7% pfd.	27½	28
India T. & R. Co., com.	..	70
India T. & R. Co., 7% pfd.	60	70
Mason T. & R. Co., The, com.	9¼	11
Mason T. & R. Co., The, 7% pfd.	50	56
Marathon T. & R. Co., com.	2½	3½
Miller Rubber Co., The, com.	55	60
Miller Rubber Co., The, 8% pfd.	62	65
Mohawk Rubber Co., The	..	80
Phoenix Rubber Co., com.	..	15
Phoenix Rubber Co., pfd.	..	80
Portage Rubber Co., The, com.	2	4
Portage Rubber Co., The, 7% pfd.	4	5
Republic Rubber Corporation, com.	¼	½
Republic Rubber Corporation, 7% pfd.	7	9
Republic Rubber Corporation, 8% pfd.	2	4
Rubber Products Co., The	..	50
Standard Tire Co., com.	..	80
Standard Tire Co., pfd.	..	80
Star Rubber Co., com.	..	90
Star Rubber Co., 8% pfd.	..	100
Swinehart T. & R. Co., com.	..	40
Swinehart T. & R. Co., 7% pfd.	..	70

NEW INCORPORATIONS

Armorclad Manufacturing Co., Inc., August 2 (New Jersey), $100,000. F. Bender, Paterson; A. Finkensieper, Clifton; L. Auerbach, Passaic—all in New Jersey. Principal office, 37 South Fourth street, Clifton, New Jersey. Agent in charge, A. Finkensieper. To buy, sell, and deal in automobile accessories, tires, tubes, etc.

B. & B. Tire Co., August 11 (Delaware), $50,000. J. Williams; R. O. Blakely; F. Bradour. Delaware Agent, Capital Trust Co. of Delaware, Wilmington, Delaware. To deal in automobile tires.

Bates & Co., Inc., J. E., August 12 (New York), $600. J. E. Bates, 374 Washington avenue; L. W. Bates, 85 Lefferts Place, both of Brooklyn; H. Clarke, 17 Ridgeview avenue, White Plains—both in New York. To manufacture leather and rubber boots and shoes.

Bogdan Cushion Wheel Hub Co., August 4 (Delaware), $1,200,000. A. B. Magee, Dover, Delaware. To manufacture cushion wheels for motors.

Boston Auto Tire Exchange, Inc., July 13 (Massachusetts), $25,000. J. Rosenfield, 89 Harrishof street, Roxbury; I. L. Rosenfield, 49 Clarkwood street, Dorchester; F. Rosenfield, 86 Elm street, Chelsea—all in Massachusetts. Principal office, Boston, Massachusetts. To manufacture rubber tires, inner tubes, etc.

Brighton Tire & Rubber Co., Inc., August 5 (New York), $10,000. R. Vagt; H. J. Hurn, both of Amityville; A. F. Rollin, 1090 Bedford avenue, Brooklyn—both in New York. Principal office, Brooklyn, New York. To manufacture tires, etc.

Broadfield Toy Co., Inc., July 18 (New York), $20,000. J. B. Billings, president and treasurer; T. B. Lavelle, vice-president and secretary. Principal office, 112 Greve street, Hempstead, New York. To manufacture toy airplanes.

Brooklyn Record Syringe Manufacturing Co., Inc., July 23 (New York), $10,000. E. Golka, president, 319 20th street; M. Golka, vice-president, 274 21st street; A. Golka, secretary and treasurer, 5807 Fifth avenue—all in Brooklyn, New York. Principal office, 310 Sixtieth street, Brooklyn, New York. To manufacture and deal in surgical instruments, etc.

Brown Puncture-Proof Tube Co., The, July 12 (Pennsylvania), $25,000. F. R. Carruth, president; R. D. Moore, vice-president; C. E. Johnson, secretary and treasurer. Principal office, 4006 Jenkins Arcade Building, Pittsburgh, Pennsylvania. To manufacture a patented puncture-proof inner tube for automobile tires.

Campbell, Inc., Charles E., July 22 (New York), $50,000. C. E. Campbell; K. K. Hillabrant, both of 44 North Drive, Great Neck; I. G. Wolf, 1270 Broadway, New York—both in New York. Principal office, Elmhurst, Long Island, New York. To manufacture rubber goods.

Carmen Tire & Rubber Co., Inc., July 28 (New York), $50,000. W. A. Marsh, 511 West 130th street; W. N. Callahan, 106 Central Park West, both in New York; F. G. Marsh, 229 Franklin avenue, Garden City—both in New York. To manufacture tires, etc.

Colombi Tire Corporation, July 13 (Massachusetts), $100,000. U. Colombi, 2 Lathrop Place, Boston; F. Pettine, 218 East Eagle street, East Boston; R. Zenoni, 2 Spruce street, Fitchburg—all in Massachusetts. Principal office, Boston, Massachusetts. To deal in and manufacture automobile tires, etc.

Corrugated Rubber Corporation, August 15 (Delaware), $1,500,000. Delaware agent, Corporation Trust Co. of America, Wilmington, Delaware. To deal in rubber.

Fibre Tire & Rubber Co., Inc., August 18 (New York), $100,000. E. E. Stoeckle, Wilson avenue; E. F. File, Bellmore avenue—both of Bellmore, Long Island, New York. M. N. Salamon, 70 Quincy street, Passaic, New Jersey. To manufacture tires, etc.

Found Tire Service, Inc., July 25 (New York), $10,000. W. H. Katz, 45 Tiemann Place, New York; C. J. Cochran, 1137 Dean street, Brooklyn; B. Zwilling, 925 Jackson avenue, Bronx—all in New York. Principal office, Brooklyn, New York. To manufacture tires.

Fur-Ever Footwear Corporation, July 29 (New York), $10,000. A. J. Geist, president; S. Alexandre, vice-president; C. J. Gordon, treasurer; J. H. Herbst, secretary. Principal office, Garden City, Long Island, New York. To manufacture rubber-lined shoes.

Genuine Rubber Co., July 18 (Massachusetts), $50,000. G. E. Dahlen, president; E. L. Castle, vice-president; P. V. Lindstrom, treasurer. Principal office, Saugus, Massachusetts. To manufacture rubber specialties.

Hudson Garter Co., July 15 (New Jersey), $100,000. Jacob Shulman, 226 Cleveland avenue; I. Hantman, 756 Harrison avenue, both of Harrison; Joseph Shulman, 17-19 Little street, Newark—both in New Jersey; M. H. Cooper, 322 East 92nd street, New York City. Principal office, 790 Broad street, Newark, New Jersey. Agent in charge, B. Newman. To manufacture garters, elastic, and rubber goods.

Lee Tire & Service Co., July 5 (Texas), $9,000. N. B., G. C., and R. J. Beard—all of Fort Worth, Texas. Principal office, Fort Worth, Texas. To buy and sell tires and accessories.

Lehr Auto Supply Co., Inc., August 18 (New York), $50,000. B. and H. Lehr, both of 9 East 109th street, New York City; J. Lehr, 652 Willoughby avenue, Brooklyn—both in New York. To deal in tires, etc.

Lightning Change Auto Wheel Corporation, August 16 (New York), $250,000. J. M. Sebring, Eggleston Hotel; F. Hess, 41 Clifford avenue, both of Rochester; R. R. Roblin, Holly—both in New York. Principal office, Rochester, New York. To deal in automobile tires, etc.

Lind-Hendrickson Co., Inc., July 29 (New York), $10,000. A. A. and B. Hendrickson, both of 14 Maple avenue, Hackensack, New Jersey; V. J. Lind, 228 Flatbush avenue, Brooklyn, New York. Principal office, 63 Dey street, New York. To manufacture and sell elastic and spring exercisers, etc.

M. F. & R. Tire Co., Inc., August 1 (New York), $500. L. Bleich; F. C. McGeechan; W. P. Riley—all of 2 Rector street, New York. To deal in tires.

Memorial Highway Tire Corporation, August 3 (New York), $25,000. W. C. Dargen, G. C. Riley, A. R. Hanson—all of 14 Ellicott square, Buffalo, New York. Principal office, Buffalo, New York.

O'Connor Rubber Co., Inc., August 1 (New York), $2,000. J. D. Fitzgerald president; R. W. Fitzgerald, secretary and treasurer, both of 348 East 78th street; H. J. O'Connor, vice-president, 1517 avenue A—both in New York. Principal office, 38 Bond street, New York. To buy and sell rubber.

Paragon Tire Co., Inc., August 16 (New York), $10,000. E. S. Wolbarst; I. P. Rieper, both of 66 Pine street; I. Skutch, 317 West 99th street—both in New York City. To manufacture tires, etc.

Paramount Hospital Supplies, Inc., June 15 (New York), $20,000. D. M. Crabb, president, 295 Mount Prospect avenue, Newark, New Jersey; I. Rosenberg, vice-president, 94 North Broadway, Yonkers; E. Spector, secretary, 51 Chambers street, New York—both in New York. Principal office, 1231 Third avenue, New York. To manufacture and sell surgical instruments, rubber goods, etc.

Peerless Safety Can & Device Manufacturing Co., Inc., June 2 (Illinois), $150,000. B. F. Allnutt; R. White, both of 2930 Giddings street, Chicago; R. Abram, Riverside—both in Illinois. Principal office, 129 South Green street, Chicago, Illinois. To manufacture, buy and sell automobile accessories, etc.

Peninsular Tire & Rubber Co., June 7 (Florida), $1,500,000. A. B. McMullen; I. D. Wood; S. H. Rogers, Jr.; W. B. Griffin; W. B. Coarsey; J. H. Stafford; T. E. Bryan; M. K. Thomas. Principal office, Tampa, Florida. To manufacture tires and tubes.

Sound Tire Service, Inc., August 3 (New York), $10,000. W. H. Katz, 45 Tiemann Place; S. Streit, 141 Attorney street, both of New York City; C. J. Cochran, 1137 Dean street, Brooklyn—both in New York. Principal office, Brooklyn, New York. To manufacture tires.

Stanard-Snyder Co., Inc., July 28 (New York), $10,000. C. H. Stanard, president and treasurer; E. Snyder, vice-president; T. Dohm, secretary—all of Syracuse, New York. Principal office, 603 North Lowell avenue, Syracuse, New York. To buy, sell, manufacture and repair all kinds of tires, etc.

Tire Service Co., July 15 (New Jersey), $50,000. J. A. Smith, 249 Delevan street; J. A. Hennessey, 83 Burnet street; W. F. Drury, 102 Suydam street—all of New Brunswick, New Jersey. Principal office, 412 George street, New Brunswick, New Jersey. To sell automobile tires, tubes, etc.

Trynoski-Peterson Tire & Accessory Co., Inc., August 13 (New York), $50,000. K. J. Trynoski; E. C. Peterson; E. C. Hanna—all of Rochester, New York. Principal office, Rochester, New York. To deal in automobile accessories.

Tyler Airless Tube Co., July 6 (Maryland), $100,000. E. L. Wade; W. J. Murphy; E. C. Rossel. Principal office, 757 Calvert Building, Baltimore, Maryland. To buy, sell and manufacture automobile tires, tubes, etc.

United Tire Co., July 7 (New Jersey), $10,000. A. Black, 1305 Princeton avenue; P. M. Dorsey, 224 Walnut avenue; H. Davidson, 1 Sanhican Drive—all of Trenton, New Jersey. Principal office, 137 East State street, Trenton, New Jersey. Agent in charge, J. I. Davidson. To buy and sell tires, etc.

Winthrop Tire & Supply Co., Inc., August 12 (New York), $5,000. E. J. Deffaa, 60 Stockholm street; J. J. Burke, 164 Highland Boulevard, both of Brooklyn; J. S. Seiler, Forest Parkway, Woodhaven, Post Office Queens Borough—both in New York. Principal office, Brooklyn, New York. To deal in tires and automobile accessories.

Yale Tire Co., July 25 (Delaware), $100,000. Delaware agent, Corporation Service Co., Wilmington, Delaware. To manufacture and sell tires.

CULP EVOLVES NOVEL PLAN

GEORGE K. CULP, who has been active in the tire industry for the past ten years, and has served in executive positions with several of the prominent companies, has organized under the name of George K. Culp, Inc., a corporation which has established offices at 56 West 45th street, New York, for the purpose of putting into effect the "Culp Plan" of cooperation in the manufacturing and merchandising of tires, tubes and other automotive accessories.

GEORGE K. CULP

According to statements by Mr. Culp, the plan is to take the surplus production of tires in this country and market it without waste, at minimum overhead costs. A number of tire manufacturers are engaged by George K. Culp, Inc., to confine their entire or surplus manufacturing capacity to the exclusive production of "Culp" and "Culp-Plan" tires. A large number of going tire stores enter into a chain store agreement that eliminates the usual factory and sales expense, by means of the delivery of Culp specification tires on a cost-plus basis. Overflow production is sold to outside accounts at store cost plus a service charge. The tire manufacturer, just like the "Culp Plan" distributer, retains control of his own business.

The tire manufacturers, it is claimed, can produce high-quality goods at low cost, having been supplied with a really and constant retail outlet, without any high selling, administrative, advertising and other expenses, while also having the opportunity of buying raw materials as a large group.

The distributer is put into virtually the position of the manufacturer, so far as the cost of tires is concerned, as the plan permits him to sell a quality tire at a low cost to the consumer, and yet, it is pointed out, with more profit to himself than other merchandising methods permit, since he takes his goods directly from the factory. As part of the Culp organization he is also assured at all times of sufficient quantities of tire merchandise of established and unvarying quality. In short, George K. Culp, Inc., is designed to give to individual distributers the advantage

of large buying power, and to manufacturers the advantage of an established market for tires.

The Culp company will maintain a staff of experts who will take care of the financial, market, technical and commercial problems for the "Culp Plan" distributers. The distributer is also allowed to make his own tire adjustments.

THE RUBBER TRADE IN THE EAST AND SOUTH

By Our Regular Correspondent

EASTERN NOTES

THE business of Poel & Kelly, crude rubber importers, 347 Madison avenue, New York, N. Y., will be carried on in the future under the name of Poel & Kelly, Inc. The directors and officers of this company are: Frank Poel, president; William J. Kelly, vice-president; and Fred Pusinelli, treasurer.

French & Handy, Inc., crude rubber dealer, 347 Madison avenue, announces that William T. Easley has been placed in charge of the company's foreign department.

The Howe Rubber Co., Inc., 4614 Prospect avenue, Cleveland, Ohio, has established a branch house and warehouse at 232 West 58th street, New York, N. Y., under the management of Lewis E. Gensler as eastern district manager.

R. H. Hale has been appointed manager of the New York branch of The Mason Tire & Rubber Co. of New York, Inc., with offices at 233 West 58th street. Mr. Hale was formerly connected with The B. F. Goodrich Rubber Co., and subsequently became head of R. H. Hale & Co., wholesale dealers in automobile tires.

At the plant of The Electric Hose & Rubber Co., 12th street, Wilmington, Delaware, a one-story addition is being erected to enlarge the lead press department, and provide improved facilities for handling the work. The company manufactures metal armored rubber hose, etc. The officers are: George S. Capelle, president; Edmund Mitchell, vice-president; and C. D. Garretson, secretary, treasurer, and general manager.

The I. B. Kleinert Rubber Co., 719-727 Broadway, New York, N. Y., has let the contract for a new factory, to be built at Fifth avenue and 18th street, College Point, Long Island. The new plant, which will cost approximately $200,000, will be a four-story and basement structure, 75 by 150 feet. The officers of the I. B. Kleinert Rubber Co. are: V. Guinzburg, president; H. A. Guinzburg, vice-president and treasurer; and A. B. Salinger, secretary. The company manufactures sanitary rubber specialties.

H. K. Simmons, formerly New York manager for The Dayton Rubber Manufacturing Co., Dayton, Ohio, has been recently appointed eastern district manager, supervising the activities of the Boston, Brooklyn, and Philadelphia branches. H. P. Canniff, one of the company's former salesmen, succeeds Mr. Simmons in the management of the New York City branch.

The A. J. Goldsmith Co. announces the removal of its offices from 27 East 22d street and the establishment of a factory for the manufacture of rubber, fabric and waterproof products, at 433 Broome street, New York, N. Y.

The Electrical Exposition, displaying electric machinery, equipment, and vehicles, will be held at the 71st Regiment Armory, New York, N. Y., September 28 to October 8.

Former Congressman Augustine Lonergan of Hartford has been named by Judge Edwin S. Thomas of the United States District Court as receiver for The Kelley Tire & Rubber Co., New Haven, Connecticut. Mr. Lonergan displaces the Bridgeport Trust Co., Attorney A. H. Barclay of New Haven and Moses Ullman of New York City as joint receivers of the company, under appointment of the Superior Court. The Kelley company, originally capitalized at $1,000,000, was later incorporated under Delaware laws at $5,000,000.

The Akron Standard Mold Co., Akron, Ohio, has appointed S. E. Johnson eastern representative to handle its standard line of mold equipment and rubber machinery. Mr. Johnson has had much experience in the rubber industry, in both foreign and domestic lines of trade. His headquarters will be at 154 Nassau street, New York, N. Y.

Joseph M. Dine, recently vice-president and general manager of The Oldfield Tire Co., has been appointed general sales manager of The Madison Tire & Rubber Co., Inc., 20 West 60th street, New York, N. Y. Mr. Dine takes the position left vacant through the resignation of J. C. Matlack.

Charles S. Leslie, crude rubber broker, has removed to Room 405, 24-26 Stone street, New York, N. Y.

A copartnership, under the name of Oliver, Keeler & Scudder, has been formed by J. William Oliver, Louis V. Keeler, and Seldon S. Scudder. The firm, with offices at 24 Stone street, New York, N. Y., will deal in crude rubber. Mr. Oliver recently sailed from San Francisco for the Far East, where he will visit Singapore, Java, and Colombo, returning to New York by the way of London.

J. J. Hanse has been appointed director of production by George K. Culp, Inc., 56 West 45th street, New York. For the past ten years Mr. Hanse has been connected with the United States Tire Co. as a department executive, and his experience there makes him particularly well fitted for his new position.

Weber deVore has been elected secretary and acting treasurer of George K. Culp, Inc., 56 West 45th street, New York, succeeding William M. Sperry, 2d, secretary, and C. C. Dobbs, treasurer. Mr. deVore will be in charge of the financial and legal departments and will work out a policy for the complete protection of the financial and legal interests of the Culp associated stores. He has been associated in the past with rubber activities in the East and Middle West and more lately with a New York financial house.

W. D. Schwartz, vice-president of the L. H. Butcher Co., Inc., 239 Front street, New York, sailed August 23, for England and the Continent. Mr. Schwartz is on a business trip in the combined interests of the company's offices in New York City, and also on the Pacific Coast.

The Askam Rubber Co., Milford, Connecticut, manufacturer of reclaimed rubber, went into receivership last June. William B. McCarthy, receiver, states that the plant is at present closed down, and that the property is for sale.

NEW JERSEY NOTES

TRENTON

The tire manufacturers of Trenton, New Jersey, report a decided boom in the industry during the past month, and according to present indications the mills will be kept busy for some time. While this applies to the tire industry alone, it is believed by manufacturers that the mechanical end will gradually pick up later.

The Ajax Rubber Co. is one of the busiest concerns in Trenton and is operating twenty-four hours a day. The tire makers are working in eight-hour shifts. There is a big demand for cord tires at the present time.

The Empire Tire & Rubber Corporation, Trenton, reports an increase in tire output with men working in two shifts. The company is operating about 70 per cent of normal. The molded hose department is now very busy and its production equals that of August of last year. The Bergougnan Rubber Corporation has been compelled to employ a Sunday force of tire makers besides its day workers. The Mercer Rubber Co. announces that there has been no change in business conditions during the summer and that the mechanical business is not making a very good showing. The Essex Rubber Co. has many orders ahead for rubber heels, the other departments also being busy. The Puritan Rubber Co., manufacturer of mechanical goods, is operating twenty hours a day with two shifts.

The United & Globe Rubber Co., Trenton, is now manufacturing the new Globestos brake blocks and is already shipping these products to all parts of the country. They are used principally for industrial machinery and for coal mining machinery of about 800 horsepower. The blocks are a combination of rubber and asbestos, fifteen inches square and five inches in thickness, and are cast in steel molds. Each section is fastened to the other with a bolt, making the circular combination strong and secure.

The Acme, Ajax, Empire, Bergougnan, Thermoid and United & Globe rubber companies donated tires to the winner in the athletic events at the Trenton Chamber of Commerce outing recently. The Essex, Home, Hamilton, Mercer, Puritan, Joseph Stokes, Semple and Whitehead Brothers rubber companies donated hose, mats, etc.

The importance of the rubber proofing industry was emphasized by Neil E. Bowman, president of the Pocono Rubber Cloth Co., before a meeting of the Trenton Rotary Club. He reviewed the history from the beginning and described in an interesting manner the primitive methods practiced in the early days.

The Trent Rubber Co., Trenton, that was recently sold by the receiver to a number of creditors, is reported to be turning out 100 tires daily, which will be increased shortly to 250 tires a day. The officers of this new company are: Thomas H. Thropp, president and general manager; James H. Morris, vice-president, and Newton A. K. Bugbee, secretary-treasurer.

A petition in bankruptcy was recently filed by the Zee-Zee Rubber Co., Trenton, New Jersey. The company's liabilities are scheduled at $293,552 and the assets at $434,964. According to Herbert P. Backes, attorney for the corporation, the failure is due to general business depression. The company's plant at Yardville, a few miles south of Trenton, was built several years ago, and is valued at $392,000.

MISCELLANEOUS NEW JERSEY NOTES

The reorganization of The Braender Rubber & Tire Co., Rutherford, New Jersey, has been practically completed. After a petition in bankruptcy was filed last May against the company, the larger creditors decided to form a corporation to take over all the assets of the present company. All creditors, excepting members of the Braender family, will receive preferred stock in this new corporation in lieu of their claims. Such creditors are advised to communicate with Milton Dammann, 61 Broadway, New York, N. Y., chairman of the creditors committee, in regard to filing proofs of claim, or for any other information concerning the company's reorganization.

The Standard Underground Cable Co., Pittsburgh, Pennsylvania, is planning to erect at Washington street, Perth Amboy, New Jersey, a 50 by 150-foot four-story building. The construction of this addition and the consequent enlargement of the plant are, however, dependent upon the action of the Board of Aldermen, to whom application has been made regarding permission to extend railroad trackage to the company's works. J. W. Marsh is president, and C. C. Baldwin, the vice-president, is in charge of the proposed construction at the Perth Amboy plant.

The following are the new directors of the New Jersey Car Spring & Rubber Co., Inc., Jersey City, New Jersey: J. J. Fields, Milford, Pennsylvania; H. H. Titsworth, J. K. Moore, and F. A. Rogers, New York, N. Y.; and G. W. Stephens, Charles Hoffman, and P. H. Ober, Mansfield, Ohio. G. W. Stephens resigned as president. F. H. Smith resigned as vice-president and general manager, and Charles Hoffman resigned as treasurer of the company. New officers were elected as follows: J. J. Fields, president; H. H. Titsworth, vice-president; and E. E. Dearth, secretary, treasurer and acting general manager.

The company manufactures mechanical rubber goods and automobile tires and tubes.

The boot and shoe department of the Lambertville Rubber Co., Lambertville, New Jersey, has been closed down because of the lack of orders and the employes have no promise when work will be resumed. The toy, ball and band departments are operating five days a week.

PENNSYLVANIA

The F. J. Stokes Machine Co., manufacturer of pharmaceutical and chemical machinery, and vacuum drying apparatus, has moved into its new plant at Tabor road and Cedar Grove Station, Philadelphia, (Olney P. O.), which occupies 5½ acres of ground, and is equipped with all modern facilities for handling light and heavy work.

F. A. Drake, who formerly sold the output of the Semple Tube Co., is now general representative of the Howe Rubber Co., Inc., Cleveland, Ohio, with headquarters in Philadelphia.

An encouraging report from the Nu-Cord Rubber Co., Greensburg, Pennsylvania, states that this plant is now running 24 hours a day, while the company expects to have its Jeannette, Pennsylvania, factory in operation in a few weeks. The Nu-Cord Rubber Co. manufactures tires and tubes. The present officers are: J. B. Reed, president and general manager; T. B. Dilts, vice-president; H. M. Donaldson, secretary-treasurer.

The Lehigh Rubber Co., New Castle, Pennsylvania, began operations on August 15 as successor to the New Castle Rubber Co. The business is now being conducted as a partnership consisting of F. A. and C. W. Sieberling. H. W. Smith is general manager. The company will manufacture automobile tires and tubes.

The Standard Underground Cable Co. is having plans and specifications prepared for a new building adjoining the present plant at 16th and 17th streets, Pittsburgh, Pennsylvania. The proposed enlargement will be a four-story and basement construction, approximately 300 by 100 feet. The contract for the new building will probably be let about September 1.

SOUTHERN NOTES

The Virginian Rubber Co., Charleston, West Virginia, elected on July 11 the following officers: A. A. Lilly, president; H. G. Young, vice-president; E. P. Stroman, secretary; and W. J. Johnson, treasurer. The factory of the Virginian Rubber Co. is a new building, with every modern facility for the manufacture of fabric and cord tires and gray tubes. Factory operations are under the supervision of T. A. Conger, a pioneer in tire manufacturing. Sales are made mainly through established jobbers located in all sections of the country. Virginian tires are made oversize and very rugged in construction, with an unusually thick tread, to meet the unusual conditions imposed on tires by the mountain roads of West Virginia.

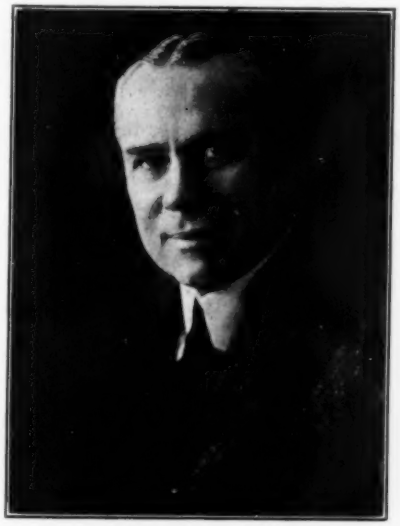
The pulverizing mills and mine of the Franklin Soapstone Products Corporation, Henry, Virginia, which were purchased about a year ago by the Blue Ridge Talc Co., Inc., have been supplied with new equipment and are now in full operation. Open-quarry methods are being used at the mines, where the formation in the side of a mountain is about 80 feet deep, and approximately 300,000 tons are in sight. At this plant of the Blue Ridge Talc Co. soapstone and talc of differing grades of fineness are prepared for use in the manufacture of rubber goods. The rock mined is sorted into three grades, and then brought to the crusher hoppers. Mine material which has not been air-dried is passed through an indirect-fired rotary dryer. The pulverizing mill has a daily capacity of 65 to 70 tons of 200 mesh product. Tests recently made by the Bureau of Standards, Washington, D. C., showed 99.9 per cent passing 200-mesh screens.

The Dayton Rubber Manufacturing Co., with factory and general offices at Dayton, Ohio, has recently opened a new direct branch at Atlanta, Georgia. Fred W. Gorman, formerly with the Brunswick Tire & Rubber Co., has been appointed local man-

ager and, with the assistance of a number of salesmen, is already meeting with considerable success in this new field.

A QUARTER-CENTURY WITH U. S. TIRE CO.

GEORGE S. SHUGART, vice president and general sales manager of the United States Tire Co., New York, N. Y., celebrated on June 24, the twenty-fifth anniversary of his connection with that company, culminating a quarter-century of notably intensive application to a single line of endeavor.



GEORGE S. SHUGART

As a youth Mr. Shugart left a good bank position to put on overalls and learn the tire business in the Morgan & Wright factory, believing it offered a more promising future. This was when the bicycle was at the height of its popularity. His marked executive ability soon brought him into sales work, and at first, many of his calls were made on a bicycle, covering sections of New York and New Jersey in which seventy-five salesmen now represent the company.

He soon became a branch manager in important posts, and since Morgan & Wright's amalgamation with the United States Rubber Co., he has continued to advance to his present important position. Mr. Shugart is regarded as one of the best informed and most efficient men in the tire selling field, and a host of well-wishers trust that many years of health, happiness and success lie before him.

CUTTING OUT NON-ESSENTIAL LINES

MOST rubber manufacturers make scores of articles because their competitors make them, because their customers demand them, or just because.

One of the New Jersey companies, the Thermoid Rubber Co., has, however, broken away from the time-honored custom, incidentally finding it very profitable, and concentrated its effort mainly upon tires, tubes, brake linings, universal joint disks, clutch rings, and radiator hose. The following is a brief outline of the articles which have been eliminated:

Air-pump hose—several styles
Brewers' hose
Bumpers
C. I. tubing
Corrugated matting
Fan belts—several styles
Force cups
Garden hose
Gasoline hose
Hockey pucks
Mallet heads
Motorcycle brake lining
Molded mats
Packing—all styles
Patches
Pedal pads
Plumbers' supplies
Pure gum tubing—several styles
Reliners
Sheet packing
Small molded goods—about 50 varieties
Stair treads
Steam hose
Vacuum hose
Valve bases for inner tubes
Washers—several styles
Water hose

Commenting upon this work the sales manager said:

"We not only standardized production but also simplified the construction of the articles still remaining. For example, we made three grades of radiator hose under two different brands, in 2-3-4 ply. Each of these grades was constructed from a different gage of rubber and represented about six different grades of duck and sheeting. On this particular article we reduced the two trade brands to one grade, using rubber of the same gage in both, and standardizing upon three grades of duck rather than six as heretofore. This enabled us to increase our machine output 100 per cent and to make better goods at a lesser unit cost. It also materially decreased the storage of raw materials and eliminated about fifteen ingredients.

"One of the troubles which we experienced prior to standardization was the utter impossibility of scheduling production. We never definitely knew the output of a machine, nor the maximum production ability of a man under varied working conditions. This human element of production was particularly baffling during periods of depression when it was necessary to shift a man from one department to another to keep him busy. Under the standardization plan we are able to schedule properly all of our merchandise and to keep definite record of labor costs on the basis of actual knowledge of what can be produced by each workman on any given machine.

"Standardization also enabled us to sell thousands of dollars' worth of old machinery which was working only 10 per cent of the time and which was kept in the factory for no other reason than to produce a few special articles, upon which we thought we were making money, but which were actually being produced at a loss. The elimination of this machinery released thousands of square feet of floor space, which also represented an additional saving.

"Another factor which must not be overlooked is that the concentration upon fewer articles has enabled our factory heads to direct all of their efforts to the development of the products which have a greater turnover and which consequently show the greatest net profit.

"Standardization has taught us that it must be confined within certain limits determined by the by-products of the merchandise produced. It cannot be carried beyond the point where the by-products of the major articles are not profitably utilized, and this is a point which, if not carefully analyzed, is likely to defeat the major purpose involved."

A TYPICAL GROUP. BRAKE LINING STANDARDIZATION COMMITTEE, THERMOID RUBBER CO., TRENTON, NEW JERSEY

UNITED STATES TIRE CO. MAINTAINS TECHNICAL SERVICE DEPARTMENT

A technical service department, made up of tire engineers, has been recently established by the United States Tire Co., New York, N. Y., to give impartial, disinterested advice to everybody engaged in truck operation.

"We intend that this technical service department shall be used freely by every person who owns a truck," said C. K. Whidden, manager of truck tire sales. "Whether an owner is a patron or not makes no difference, all our facilities for correct information

are at his disposal. Nearly half of the trucks of the country are operating on the wrong kind of tires. This is a condition which we hope to correct."

AMERICAN SOCIETY FOR TESTING MATERIALS ELECTS OFFICERS

The American Society for Testing Materials, Engineers' Club Building, 1315 Spruce street, Philadelphia, Pennsylvania, elected the following officers during the annual meeting held at Asbury Park, New Jersey, June 21-24:

President (for one year): C. D. Young, general supervisor of stores, Pennsylvania System, Philadelphia, Pennsylvania.

Vice-president (for two years): Guilliaem Aertsen, assistant to the vice-president, Midvale Steel and Ordance Co., Philadelphia, Pennsylvania.

Members of Executive Committee (for two years): F. R. Baxter, chief of testing laboratory, Vacuum Oil Co., Rochester, N. Y.; E. D. Boyer, cement expert, Atlas Portland Cement Co., New York, N. Y.; F. M. Farmer, chief engineer, Electrical Testing Laboratories, New York, N. Y.; W. H. Fulweiler, chief chemist, United Gas Improvement Co., Philadelphia, Pennsylvania.

Committee D-13 on Textile Materials will hold a meeting October 28 at Providence, Rhode Island.

THE RUBBER TRADE IN RHODE ISLAND

By Our Regular Correspondent

THE close of August found a more encouraging feeling prevailing among industrial concerns of Rhode Island, through the evidences of an improvement in general prospects, as well as an apparent stabilizing tendency of conditions that give promise of an early advance toward the much desired normalcy.

After months of partial or complete idleness, many of the textile plants engaged in the production of tire fabrics are gradually resuming operations and the indications are favorable to further expansions in this direction.

One of the largest plants of this character that has resumed is that of the United States Cotton Division of the Jenckes Spinning Co., on Fountain street, Central Falls, Rhode Island, where approximately 350 employes began operations about the first of August after a period of two months of inactivity. The plant, which manufactures yarns for use in tire fabrics, suspended operations early last May. The number of employes has been increased as conditions have improved until there are now upwards of 500 employed at the plant.

After a shut-down of nearly two months the factory of the National India Rubber Co., at Bristol, Rhode Island, is reopening, it having been decided that the Keds division will have its first day's making on Tuesday, September 6. Other departments are resuming in regular order, beginning with the machine cutting department, which opened on Monday, August 22. To what percentage of the full complement of more than 4,000 operatives work will be afforded will be dependent entirely upon the extent to which orders are received, but it is the intention of the management to maintain operations to the fullest extent possible, both as regards hours and numbers.

The plants of the Revere, Providence, Bourn and Devol rubber companies, Providence, and of the Woonsocket Rubber Co.'s plants at Woonsocket and Millville, are in operation, although on curtailed time and employment schedules, in some departments.

Probably no incident of the past month was of more significance to the commercial, industrial and political affairs of Rhode Island than the death of Colonel Samuel Pomeroy Colt. The news of his death caused keen regret throughout the Commonwealth and State and city officials and business men united in expressions of praise for his character and career and of sympathy for the family. The town of Bristol, in which Colonel Colt began his business career, in which he had always maintained his home, and in which he died, mourned the passing of its first citizen with a keen sense of loss. Word of his death was sent promptly to the plant of the National India Rubber Co., which formed one of the links in the chain of industries controlled by him, and the bell on the factory was rung for half an hour and the flag was set at half-mast.

Despite the general business depression of the past six months, the tax assessment announced by the State Tax Commissioners on the corporate excess of corporations in Rhode Island computed to the close of the fiscal year of June 30, shows no striking evidences of such depression. The total tax assessed is $1,777,834.05, an increase of $50,053.94 over that for the year 1920. The total corporate excess this year upon which the tax is levied is $320,479,151.81. Among the corporations upon which the taxable excess is $100,000 or more are the following that are connected directly or indirectly with the rubber industry and the amount of the assessed valuation:

American Multiple Fabric Co., $131,997.18; American Webbing Co., $283,712.54; Atlantic Tubing Co., $187,730.00; Bourn Rubber Co., $308,306.29; Collyer Insulated Wire Co., Pawtucket, $365,329.69; Davol Rubber Co., $356,482.67; Everlastik, Inc., Boston, $186,222.54; Glendale Elastic Fabric Co., East Hampton, Massachusetts, $197,238.80; The B. F. Goodrich Rubber Co., Akron, Ohio, $222,336.73; The Goodyear Tire & Rubber Co., Akron, Ohio, $425,000.01; George Grow Tire Co., Boston, $107,500.25; Hamilton Web Co., Hamilton, $289,475.65; Hope Webbing Co., Pawtucket, $1,313,144.35; Jenckes Spinning Co., Pawtucket, $8,739,115.00; Mechanical Fabric Co., $586,826.06; National India Rubber Co., Bristol, $2,257,155.36; New England Butt Co., $347,070.17; Ninigret Co., Pawtucket, $1,754,340.00; O'Bannon Corporation, West Barrington, $869,600.00; Revere Rubber Co., $641,003.50; Tubular Woven Fabric Co., Pawtucket, $167,902.05; United States Rubber Co., New York, $2,247,291.26; Woonsocket Rubber Co., Woonsocket, $537,673.60.

In the list of tax assessments in the town of Bristol, just completed, by far the largest taxpayer is the United States Rubber Co., of New Jersey, which is taxed this year on a total valuation of $1,990,500 on all the property it owns in that town. This is an increase in valuation of $875,400 over that of last year. The tax to be paid by this corporation this year is $44,786.25, an increase of $18,246.87 over last year.

The announcement of the proposed consolidation of The Fisk Rubber Co., The Federal Rubber Co., and The Ninigret Co., a subsidiary fabric manufacturing corporation, was received in Rhode Island with more than usual interest from the fact that one of the plants of the Ninigret Co., is located in Pawtucket, where the corporation purchased the old Greene & Daniels mills and equipped and arranged them to meet the requirements of the corporation.

The sixth annual outing of the employes of the Revere Rubber Co., was held last month at the Hummocks in Hamilton, and more than 400 attended. After an enjoyable sail down Narragansett Bay, with an orchestra on board, the excursionists sat down to an appetizing luncheon at 12:30 o'clock. Then followed an elaborate card of sports and athletic events as well as dancing, bathing, and various other forms of entertainment. Prizes were awarded in connection with every event and when the party had enjoyed an old-fashioned Rhode Island clambake that was served at 5 o'clock, everyone voted that the committee had provided a perfect day.

Employes of the Bourn Rubber Co., to the number of nearly 200 conducted their annual outing last month at Duby's Grove on the banks of the Pawtuxet river. A lunch was served upon the arrival of the party at noon after which field sports were in order. Despite the rain the games went on, and the baseball contest between the cutters and the makers terminated in victory for the cutters by a score of 7 to 6, while the married men won the tug-of-war from their single opponents.

Henry C. Wagner, who was in the employ of the Woonsocket Rubber Co., for more than 15 years, has been elected general factory manager and a director of the Beacon Falls Rubber Shoe Co., and has assumed his new duties. The Beacon Falls company, operating two plants, one at Beacon Falls, Connecticut, and the other at College Point, Long Island, employs approximately 1,600 operatives. Recently Mr. Wagner was on the executive staff of the United States Rubber Co., as assistant to Myron H. Clark, general manager of the footwear division. While in the employ of the Woonsocket Rubber Co., he was successively superintendent of the Millville factory and of the Alice Mill at Woonsocket, and later, general superintendent of both plants.

According to a recent announcement from the American Wringer plant, Woonsocket, Rudolph Kowaiski has been made plant superintendent, and Charles Yahaux, assistant plant superintendent. Mr. Yahaux, who has been with the firm for nearly thirty years, will be in direct charge of the rubber working department. Definite plans as to the reopening of the plant on full time at an early date are now being considered.

The Apex Tire & Rubber Co. has been granted a charter under the laws of Rhode Island, to manufacture and deal in auto tires, etc., the capital stock being 250 shares of common stock without par value. The stockholders are David W. Smith, John M. Franklin and Charles H. Sprague.

According to statements filed with the city clerk's office in their respective cities the Newton Tire Shop, 400 Dexter avenue, Central Falls, is owned by John Newton and Herbert A. Newton, and the Lotta Miles Tire Co., 1035 Broad street, Providence, by William E. Angell.

THE RUBBER TRADE IN MASSACHUSETTS

By Our Regular Correspondent

BUSINESS in the rubber industry of Massachusetts continues unsettled and the future uncertain. Tire demand is holding up very well and most tire plants are operating at or very near capacity, but it is feared that there may be a falling off during the autumn months. The large production of rubber heels and soles continues with no indication of abatement. Owing to fine weather it has been a good year for canvas footwear. As usual this branch has been slack since July 1, but the new season ordinarily starts September 1. Rubber footwear production is suffering from the exceptionally open weather last winter. Should the late autumn open with storms indicating an early winter there is likely to be a shortage of rubber footwear. The mechanical rubber goods situation reflects the stagnation of general business, as does the decreased demand for stationers' sundries. Some improvement in druggists' sundries is anticipated this fall. The proofing branch continues quiet, and reclaimers, though operating at only about 25 per cent capacity, are optimistic regarding the fall demand for their better grades.

Inspectors connected with the Massachusetts Department of Public Works are continuing their campaign against overloaded motor trucks which are damaging highways throughout the state.

Under the law trucks may not carry more than 800 pounds per inch width of their tires, and in no case are they allowed more than a 14-ton load. In ascertaining the weight of a heavily loaded truck inspectors first lay a piece of white paper on the roadway and have the truck driven over it. The imprint of the tire is then measured and the total permissible weight of the truck and freight is calculated in accordance with the regulation cited above. A loadometer is then placed successively under the front and rear wheels of the truck to learn if the weight is within the legal limit.

INDUSTRIAL ABSENTEEISM

In a paper recently read before the American Association of Industrial Physicians and Surgeons, Dr. Robert S. Quinby, service manager of the Hood Rubber Co., Watertown, has given the results of twenty-eight months' study on the subject of industrial absenteeism in the Hood factory, where the average force of 6,700 persons consisted of 65 per cent males and 35 per cent females, about 50 per cent being of foreign birth.

The number of days lost per employe per year and the reason therefor was as follows: sickness, 6.61; industrial accident, 0.45; non-industrial accident, 0.25; personal reasons, 10.95; total for all causes, 18.26. On a percentage basis the total average time lost from all causes was 5½ per cent, of which 2 per cent was due to sickness, 0.14 per cent to industrial accidents and 0.08 per cent to non-industrial accidents. Dr. Quinby feels that only during unusual periods should sickness disability exceed 2 per cent of the working time, or 6 days per employe based on a 300-day working year..

It was found that single males lost the least time, married males 2 per cent more, widowed and divorced males 21 per cent more, females 40 per cent more, widowed and divorced females 154 per cent more, while married females lost 175 per cent more time than single males. Male employes averaged a loss of 5 days per year on account of sickness, while females lost 8¾ days.

Above the age of forty, the male disability rate increased rapidly, while in the case of females the increase was apparent above the age of forty. Persons of American birth tended to lose less time on account of sickness and accident than those of foreign birth.

The number of days disability per person lost on account of the more important diseases was as follows: influenza, .718; colds, .53; tonsilitis, .341; bronchitis, .312; tuberculosis, .24; rheumatism, .235. Combined respiratory diseases caused over 35 per cent of the total disability due to sickness and accident in 1920.

The length of disabilities due to sickness and accident was as follows: less than 1 week, 20 per cent of cases; less than 2 weeks, 27 per cent; less than 3 weeks, 52 per cent; less than 4 weeks, 68 per cent; less than 7 weeks, 83 per cent; less than 13 weeks, 93 per cent; less than 26 weeks, 98.5 per cent.

BOSTON NOTES

Receivers for the O'Bannon Corporation, Boston, have been appointed as follows: Richard LeBaron Bowen, general manager of the O'Bannon Corporation, is receiver of the corporation for the State of Rhode Island, and also, with Ripley L. Dana, receiver for the commonwealth of Massachusetts. All plants of the O'Bannon Corporation are now being operated by the receivers, new orders are being taken, and additional business solicited. William B. Simpson, the former purchasing agent, has severed his connection with the corporation, and raw materials are being purchased by the receivers.

MISCELLANEOUS MASSACHUSETTS NOTES

The Easthampton Rubber Thread Co., Easthampton, Massacusetts, reports that, at its recent election, no changes were made in the company's board of directors. Those constituting this board are as follows: William G. Bassett, president; L. S. Stowe, treasurer; F. W. Pitcher, general manager; R. L. Williston and W. L. Pitcher.

The Standard Rubber Cement Co., Canton, Massachusetts, specializes in standardized products for the shoe trade. The principal line of manufacture includes channel, sole and rubber heel cements. The rubber heel cement is said to be a superior product.

Claiming that the business was being run at a loss, creditors of the British-American Manufacturing Co., Springdale, Connecticut, have voted that the receivers would be justified in applying to the United States District Court for permission to sell the plant and wind up the business. The concern in question, which manufactures rubberized cloth, was organized in 1914, and took over the Interstate Rubber Co., which manufactured a product similar to its own. The plant of the British-American Co. is said

to be valued at $250,000, while liabilities, largely for raw material, are estimated at $470,000.

Encouraging reports from the Meade Rubber Co., Stoughton, Massachusetts, state that the company's output is being materially increased, which necessitated the installation of a 500 h.p. engine and additional presses. Officials of the company claim that business conditions seem to be improving, and that they are looking forward to a good season. Rubber heels and rubberized fabrics are the products manufactured.

GEORGE B. HENDRICK

George B. Hendrick, publicity manager of The Fisk Rubber Co., Chicopee Falls, Massachusetts, was recently appointed chairman of a committee organized to advertise the Direct Mail and Advertising Association Convention and Exposition which will be held at Springfield, Massachusetts, October 25-28, inclusive. Mr. Hendrick, who is president of the Publicity Club of Springfield, has been in advertising and publicity work throughout practically all his business career, and was especially active during the war. He was appointed publicity manager for The Fisk Rubber Co. about six years ago, and has an excelent record of achievement to his credit.

With the production of nearly 10,000 casings and 13,000 tubes daily, The Fisk Rubber Co., Chicopee Falls, is operating at 90 per cent of its peak capacity. The August production schedule called for 225,000 tires, an increase of 32 per cent over the July output of 170,000 tires, which in turn represented an increase of nearly 50 per cent over June.

Operations will begin again in September at the plant of the Monatiquot Rubber Works Co., South Braintree, Massachusetts. Since the fire in February last, new and improved equipment has been added and many changes made. Several new products of interest to the trade are to be manufactured, and will continue to sustain the good reputation this company's product has already made. The officers are: James H. Stedman, president and treasurer; Merton A. Turner, vice-president and sales manager; and Benjamin Ayer, general factory manager.

The board of directors of the Res-Pro Industries, Inc., Boston, Massachusetts, recently held an important meeting when plans for the further financing of their organization were discussed. James J. Clifford, president and director, has resigned, and Luther S. Newell, formerly general manager of the Anchor Webbing Co., Pawtucket, Rhode Island, has been elected president. Recently elected directors are: William H. Gidley, formerly treasurer and general manager of Greene & Daniels Manufacturing Co., Pawtucket, Rhode Island; and Howard E. Burdick, of Woonsocket, Rhode Island, president of the Burdick-Clarke Co., of Providence. The company's offices will be removed from Boston to Canton, Massachusetts, where the factory is located.

The Converse Rubber Shoe Co., Malden, resumed operations August 8, following the customary two weeks' vacation shutdown. Enough goods have been sold to keep the factory running at 80 per cent capacity until December 1. President Converse states that the first quarter of the firm's fiscal year ended July 1 was the best the company has ever had, and he has every reason to believe the other nine months will be as good. The coupon note issue of $285,000 maturing on August 1, was paid on that date.

Sales of the Hood Rubber Co., Watertown, for the first six months of this year were almost equal to those for the first half of the year 1919, although some $5,000,000 behind the record-breaking figures for the same period of 1920. The tire department is running to full capacity and canvas footwear business has been better than was anticipated.

Harrison S. Royce has succeeded M. G. Hopkins as purchasing agent of the Boston Woven Hose & Rubber Co., Cambridge.

The Genuine Rubber Co., Saugus, a Massachusetts corporation with a capital stock of $50,000, consisting of 2,000 shares of $25 par value, was incorporated July 18 for the manufacture of rubber heels and soles, automobile step plates and other rubber specialties. Gustav E. Dahlen is president, Ernest L. Castle, vice-president and Paul V. Lindstrom, treasurer. The new firm has leased part of the "Made-Leather" factory in Saugus and has installed the necessary equipment.

WORCESTER TIRE FABRIC CO.'S NEW MILL

Production has been started at the new mill of the Worcester Tire Fabric Co., Worcester, the capacity of which is 4,000,000 pounds of fabric a year. The building is of steel and concrete and has four manufacturing floors and one storage floor with a total floor space of 50,000 square feet.

All machinery is operated by individual motor drive requiring a total of 600 horsepower. On the two upper floors are ring twisters for the preparation of five-ply strand twist. On the second floor are special Brownell gear-driven flier cord twisters which combine the three strands into the finished cord. The result of this process is maximum strength without variance of twist. On the first floor is the weaving room. It is equipped with cord fabric looms with attachments and refinements of the company's own design and construction.

The Worcester Tire Fabric Co., was incorporated in 1913 in Massachusetts. C. R. Brownell and A. D. Sykes, both of Worcester, are president, and treasurer and manager respectively, and H. J. Adams, Akron representative, is vice-president. The board of directors is composed of the officers together with G. L. Brownell, of Worcester.

THE RUBBER TRADE IN OHIO

By Our Regular Correspondent

AKRON TIRE PRODUCTION APPROACHING NORMAL

While the tire departments of the Akron rubber factories are operating at better than 80 per cent of normal, making 75,000 tires a day, the other lines of rubber goods continue to show improvement. Reports from the druggists' sundries departments indicate that July showed 25 per cent increase in sales over the previous month, due largely to sales of rubber bands, hot-water bottles, and other sundries, which indicate that business in the fall will be fairly good. The present is more or less between seasons and the fact that increases are registered is looked upon as an indication of a turn for the better. Mechanical goods sales continue to show some increases. Cement and concrete manufacturers are operating at peak, and manufacturers of washing machinery and sweepers are operating at normal. Sales indicate that packers, paper manufacturers, sugar refiners and many other lines of industry are purchasing rubber supplies for replacements to put their plants into operation in the very near future. One sales manager of mechanical goods believes that the tide has definitely turned and a better tone is clearly marked in the present situation. On the whole the mechanical goods departments await the improvements in the steel industry and in the railroad situation. Footwear sales continue as well as can be expected at this time of the year and indications are becoming clearer that a seasonable fall will mean 100 per cent operation of these departments by the first of the coming year. The reclaiming of rubber remains dormant because of the low price of crude rubber.

It is reported that practically every rubber company in Akron, with the exception of the large factories which were caught with heavy commitments, are buying tire fabric and the larger companies have ordered in large quantities shipment of material contracted for. Lower prices are not looked for during the remainder of the year, despite the large hold-over cotton crop in the South. Buying of fabric throughout the country, as in Akron, is confined to spot orders with demands for immediate delivery.

INCREASED FACTORY EFFICIENCY

The great change in the Akron rubber industry as a result of the business depression which has now lasted about a year is nowhere more apparent than in the increased efficiency of the individual workmen in the factories. At the present time with production of all the Akron factories close to 75,000 tires a day, a total of 27,000 day and piece-workers are employed. A year ago, when the industry was running at peak and approximately 90,000 tires were made daily, approximately 72,000 men and women piece-workers and day-workers were employed. As a typical example of the increased efficiency The Goodyear Tire & Rubber Co. recently announced that the company is now producing 30,000 tubes daily, a new record, with a total of 525 piece-workers. A year ago it required 1,100 men to produce a total of what was then peak tube production of 23,000 a day.

These figures indicate the change which has come about in the industry. Men are today working with every ounce of energy bent upon production. The overhead has been cut to the very bone, and the process of readjustment continues. Every man and woman in office or factory who can be dispensed with is dismissed and his place is not being filled. Wages have taken a drop which is almost as large as the increase in efficiency. Tire builders and finishers who were paid $1.25 an hour a year and one-half ago are now being taken on at 60 to 80 cents an hour, and common labor which a year ago would scarcely consider anything less than a dollar an hour is now being hired for 30 cents an hour, while the rate for women has dropped to 25 cents an hour. With piece-work still an important feature in those departments where it is feasible, it is possible for the workers to make much larger sums, but at best the wages received do not compare with peak post-war wages. It is conservatively estimated that wages as a whole have dropped between 35 and 40 per cent to date and that other adjustments can be expected, especially in salaries.

AKRON NOTES

Shelby A. Falor, president of the Falor Manufacturing Co., 126 West South street, Akron, Ohio, is a native of Akron, and his entire business career is connected with the rubber industry of that city. Beginning twenty years ago with The Goodyear Tire & Rubber Co. as a clerk, he has successively filled various positions, becoming manager of one of the departments, and finally, three years ago, was appointed a member of the company's board of control.

SHELBY A. FALOR

Mr. Falor has a wide acquaintance in the rubber industry, and is familiar with the business, along both selling and production lines. The new company will specialize in the manufacture of high-grade inner tubes.

The Firestone Tire & Rubber Co., Akron, Ohio, reports an increasing production of tires and tubes, which almost equals the peak production of 1920. At present the schedule varies between 26,000 and 28,000 tires daily, with a corresponding output of almost 30,000 tubes. The plant is operating six full days a week, with two shifts of nine hours each. In one or two departments three shifts of eight hours each is the rule. Sales to manufacturers continue encouraging, while August sales to dealers promise to be among the highest for any one month in Firestone history.

The Firestone Tire & Rubber Co., Akron, Ohio, has gathered statistics concerning the care being taken of their tires by automobilists and truck owners. They find that more attention is being paid to this subject than formerly, and there are fewer cases of tire abuse. Motorists and operators of trucks realize the importance of frequent checking up for possible imperfections in wheel alinement, tire inflation, etc. Today, with prices at the lowest level and quality of the best, an opportunity is afforded to demonstrate the worth that has been built into the modern tire.

Reports to the Firestone Tire & Rubber Co., Akron, early in the month indicated that the automotive industry is operating at about 61 per cent of the production registered in July this year. Firestone manufactures original tire equipment for 47 automobile manufacturers and also produces about about 65 per cent of the rim equipment for the country. It was reported at Firestone that although there is little actual profit in the manufacture of tires at the present time because of the actual cost of materials, the first of September will probably see enough of the old high-priced inventory worked off to enable the company to show an actual production profit.

H. B. Clingerman, industrial engineer of The B. F. Goodrich Co., Ernest Brownwood, The Goodyear Tire & Rubber Co., and J. A. Hildebrand, chairman of the smoke abatement committee of the Akron Chamber of Commerce, are among the five citizens appointed by the Mayor of Akron to serve as the smoke abatement commission recently organized.

The Goodyear Tire & Rubber Co., Akron, announced during the middle of August that 900 men were to be laid off. E. G. Wilmer, president of the company, stated that the decrease in working forces will not materially reduce production of 25,000 tires and 30,000 tubes a day.

Goodyear has inaugurated the budget plan which demanded either decrease in personnel or cuts in salary and personnel decreases were impossible in many departments. During the month Don Stevens, for many years head of the factory labor department of Goodyear, resigned. With him went Marshall Morris, formerly assistant general manager of the Los Angeles plant and later in charge of stock sales for the company. Harry Blackburn, assistant treasurer, and F. F. Dugan, formerly in charge of sales personnel, were among the others who left Goodyear during the month. C. C. Prather, manager of the products department, has been transferred to the sales department at Cincinnati and W. D. Shilts, formerly chairman of the board of control, has been made traveling auditor.

Willard Seiberling, head of the aeronautical department of The Goodyear Tire & Rubber Co., and Wade T. Van Orman, official of the department, will take part in the international free balloon race which is to be staged in Belgium, September 18. The "City of Akron," to be flown by these aeronauts, has been designated by the Aero Club of America as one of the American contenders for the international cup.

E. E. Helm, formerly head of the publicity department of The Goodyear Tire & Rubber Co., has resigned and will be succeeded by Hugh Allen, formerly managing editor of the *Beacon Journal*, an afternoon daily, and subsequently editor of *The Wingfoot Clan*, the official paper of the Goodyear factory.

The Amazon Rubber Co., Akron, following complete reorganization and some refinancing, started into production on a small scale during the second week in August and by the first of September will be manufacturing several hundred tires a day. L. J. Shott, founder of the company, is president of the new company; Albert Kroehle, Adam Kroehle Sons Co., Cleveland, is vice-president; R. C. Fulmer is treasurer, and C. E. Bettler is secretary.

Mr. Schott founded the Amazon Rubber Co. in 1916 and actual production started early in 1917. A year and a half ago the company was taken over by Dr. E. E. Quirk who has withdrawn from the company. The return of Mr. Schott to the business has created confidence on the part of the stockholders regarding the company's future, and to a large extent his return was responsible for the ready response of the stockholders to the request for additional capital.

The Adamson Machine Co., Akron, reports that while the plant is not operating anywhere near capacity, sufficient work is being found to keep it operating at less than half of normal.

Indications are, however, that prospects for the future are beginning to look brighter. The work which the company is doing at the present time is for the most part from the smaller factories.

The Akron Machine, Mold, Tool & Die Co., Akron, which has been operating for the last year, because of its comparatively small capacity has found sufficient business to operate day and night for the larger part of the last two months. A large portion of its work is for rubber companies near rather than in Akron.

The I. H. Dexter Co., Inc., Goshen, New York, has named the Akron Standard Mold Co., Akron, Ohio, its exclusive representative. This will necessitate the addition by the Akron company of the following products: bead wrapping, flap making and curing machinery. Andrew J. Fleiter is vice-president and general manager and J. C. Clinefelter is sales manager of the Akron Standard Mold Co.

MISCELLANEOUS OHIO NOTES

M. M. Whorley, who has been recently appointed sales manager of The Columbus Tire & Rubber Co., Columbus, Ohio, has filled various positions of responsibility in connection with the tire industry. Beginning in 1912 as a salesman for the Firestone company, he became manager of this company's Syracuse, New York, branch, and later was appointed assistant sales manager of The Mason Tire & Rubber Co. at Kent, Ohio. This position he held until his present appointment with the Columbus company. It is reported that this concern is daily producing 200 cord and fabric tires and 400 tubes.

On July 16 last The Ohio State Rubber Tire Co., Port Clinton, Ohio, went into receivership in equity in the United States District Court. William J. Slater, of Akron, Ohio, was appointed receiver.

The Waukon Rubber Co., capitalized at $500,000, and recently organized in Elyria, Ohio, will take over the assets and liabilities of the Hill Rubber Heel Co. The new company will construct a modern plant to manufacture air-cushion heels, automobile tubes and dipped goods. Officers and directors of the new company are: W. R. Huntington, president; O. S. Dollison, vice-president; J. W. Dewhurst, secretary and general manager; and J. A. Ebert, treasurer.

William A. Cuff, secretary of The Mason Tire & Rubber Co., has been named a member of the board of trustees of the Kent Normal School, a state institution at Kent, Ohio. He has been active in politics for many years.

The Mason Tire & Rubber Co., of Kent, Ohio, reports that on the basis of 24 hours a day operation, the plant is turning out more than 2,000 tires a day, and that the new Ford size tire selling for $13.50, which was recently placed upon the market, is oversold for the remainder of the year. At the present time the company reports sales increases of approximately 50 per cent in value over the same time last year, while the sales in units will run in many instances more than four to one as compared with the same period last year. Production of truck tires, both pneumatic and solid, are reported as increasing steadily, and, owing to the fact that consumers and dealers are buying only current requirements, the officials of the company look for business to hold up well throughout August and probably into September. The company recently entered into the original equipment field.

JUDGES APPOINTED FOR FIRESTONE SCHOLARSHIP COMPETITION

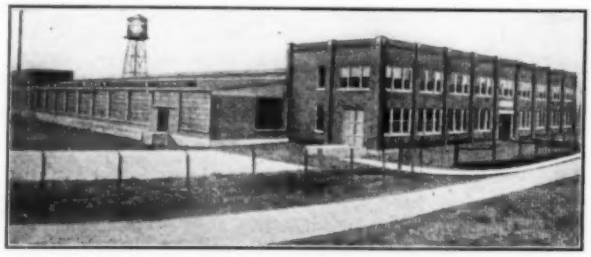
The best essays on "Good Roads and Highway Transport" which have been submitted during the last six weeks by high school pupils in the Harvey S. Firestone competition will be presented to the following judges for final decision: A. N. Johnson, dean of the department of engineering, University of Maryland, chairman; Harford Powel, Jr., Editor of *Collier's Weekly*; C. H. Huston, assistant secretary of the Department of Commerce and president of the Lee Highway Association.

THE BUCKEYE RUBBER PRODUCTS CO.

The Buckeye Rubber Products Co., an Ohio corporation organized for the manufacture of mechanical rubber goods, began manufacturing operations last month, at its plant in Willoughby, Ohio.

The main factory building is a one-story brick and steel structure, 180 by 350 feet, to which is joined a two-story building, 50 by 150 feet, containing offices, shipping room, time-keeper's office, first-aid room and laboratory. The buildings were originally built for the Ben-Hur Motor Co. but were not used for industrial purposes other than a government experimental plant for the development of poison gases during the war.

The land and buildings were purchased by The Buckeye Rubber Products Co. in January, 1920, and since then the plant has been arranged to meet the requirements of mechanical goods



NEW PLANT OF THE BUCKEYE RUBBER PRODUCTS CO., WILLOUGHBY, OHIO

manufacture. Equipment has been installed for the manufacture of belting, matting, mats, molded goods, heels, friction tape, tubing, sheet packing and solid truck tires.

The Polack Tyre & Rubber Co. was acquired by the Buckeye company last year and its manufacturing equipment transferred to the Buckeye plant where Polack solid truck tires continue to be made.

The Buckeye Rubber Products Co. manufactures only the highest quality of rubber goods, and although a new-comer in the rubber manufacturing field, the personnel, both executive and manufacturing, comprises men of long and successful experience in their respective departments. The officers are: Charles H. Roth, president and general manager; Webster Norris, vice-president and technologist; James M. Mackay, secretary and sales manager; William E. Marks, treasurer; Edwin L. Stimson, factory manager.

WARN AGAINST A. E. F. TIRES

Akron tire companies have issued warnings to their dealers and to tire users generally to beware of American army tires which have been brought back from Europe and which have been placed on the American market. Because of exposure to weather for a long time many of the tires have deteriorated and in many instances the expected service can not be obtained from them. The number of these kinds of tires now on the market is very large, it is stated, although definite figures are not available.

EGYPTIAN COTTON FAILS IN TEXAS

It has been found that Egyptian cotton cannot be satisfactorily grown in Texas, according to a report recently made by the United States Department of Agriculture, Washington, D. C.

Careful and long-continued experiments with Egyptian cotton have proved that it is more susceptible to diseases and more exposed to weevil injury than other varieties. Durango cotton, however, appears to flourish in some parts of Texas, and attempts to raise this would seem to promise better success than any further attempts to grow the first-mentioned variety.

THE RUBBER TRADE IN THE MID-WEST

By Our Regular Correspondent

MID-WEST RUBBER MANUFACTURERS' ASSOCIATION

THE regular monthly meeting of the Mid-West Rubber Manufacturers' Association was held August 9 at the Chicago Athletic Association, Chicago, Illinois. The most important matters under consideration at the board meeting were the resignations of George B. Dryden, of the Dryden Rubber Co., as treasurer of the association, and D. M. Mason, of the Mason Tire & Rubber Co., as president.

The new president of the association, W. W. Wuchter, of The Nebraska Tire & Rubber Co., Omaha, Nebraska, was formerly vice-president. The matter of electing a first vice-president to succeed him was postponed until the next meeting. To fill Mr. Dryden's unexpired term as treasurer the election was announced of Samuel J. Turnes, of the Brunswick-Balke-Collender Co.

An interesting feature of the occasion was a talk by W. E. Byles of New York concerning the present situation in the rubber industry. Other speakers at the meeting were: H. W. Ramsay, Cupples Company, St. Louis, Missouri; J. B. Longini, Pittsburgh Valve & Foundry Co.; C. H. Taveniere, Fred Stern & Co.; H. A. MacKusick, Philadelphia Rubber Works Co.; W. G. Brown, The Spreckels "Savage" Tire Co., San Diego, California; Sidney J. Roy, The Hannibal Rubber Co., Hannibal, Missouri; and H. O. Smith, The Racine Tire & Rubber Co., Racine, Wisconsin.

MISCELLANEOUS MID-WESTERN NOTES

William M. Gunlock, under whose direction the "Spring-Step" rubber heel has gained so great a publicity, is now vice-president of the Dryden Rubber Co., 1014 South Kildare avenue, Chicago, Illinois. Mr. Gunlock will be in charge of this company's heel and sole departments.

The Sears Tire Equipment Co., Davenport, Iowa, recently became the successor to the Altenburg Tire Equipment Co., and will continue the manufacture of tire making and tire-repairing machinery. Under the new organization the officers are: V. D. Sears, president and sales manager; R. P. Hayes, vice-president and general manager; and E. H. Hoehn, secretary and treasurer.

Favorable indications of a continuance of its present twenty-four hour schedule is the report made by the Odell Rubber Co., manufacturer of South Bend and Odell tires and tubes at South Bend, Indiana. A new building, 80 by 146 feet, of brick and steel construction, and costing approximately $50,000, is a recent addition. This will be used for office and warehouse purposes. R. M. Voorhees, secretary of the Odell company, claims that business conditions for the first six months of 1921 have been very satisfactory.

The entire property of The Fort Wayne Tire & Rubber Manufacturing Co., Fort Wayne, Indiana, including 2½ acres of ground, buildings, machinery and stock, was recently sold to Henry J. Bowerfind, of Fort Wayne, Indiana, for $90,000. The plant is to be dismantled, and reequipped for the purpose of manufacturing paint.

An optimistic report from The Jefferson Rubber Co., Jefferson, Wisconsin, states that the company's operations have steadily increased during the last four months. The output of tires and tubes per month, as at present planned, will be six times greater than the production, for a corresponding period, during the company's first year of business. Officials of the company claim that sales of their products are exceeding all expectations. R. W. Lyons is president.

The appointment of C. F. Faro, as Chicago district manager for The Dayton Rubber Manufacturing Co., Dayton, Ohio, has been recently announced. Mr. Faro will also have general supervision of the company's Kansas City and Denver branches. The local manager for Kansas City is George P. Colman, formerly one of the Dayton Rubber Co.'s special representatives; and for Denver, J. H. Redfern, previously connected with The Goodyear Tire & Rubber Co.

The Link-Belt Co., 910 South Michigan avenue, Chicago, Illinois, announces a practically uniform reduction of 10 per cent on malleable iron and steel—SS class—chains, sprockets, buckets, and other products. This price reduction becomes effective at once. Discounts are made on application.

Plans for the proposed St. Louis factory of the Standard Underground Cable Co., Pittsburgh, Pennsylvania, are subservient to present labor conditions and costs of building materials. Until some improvement is noted in these matters nothing further will be done beyond preparing plans and specifications for the building and grading the building site.

THE RUBBER TRADE ON THE PACIFIC COAST

By Our Regular Correspondent

NORMALCY may not actually have arrived in the rubber trade on the Pacific Coast, but manufacturers and dealers agree that it is within hailing distance. With very few exceptions, trade leaders report a steady improvement in business, some stating that conditions for the latter half of 1921 will be better than a year ago. As might be expected, the improvement is most marked in tire sales, the volume mounting steadily from week to week. Warehouse stocks are low, and dealers often find it difficult to get factory orders filled promptly, owing to small stocks or the limited production. While tire sales are better in the lower coast territory, the Northwest is holding its own remarkably well, being favored with agreeable weather conditions. Coast-made tires and tubes are making good headway, although the eastern and mid-western products are maintaining their old-time precedence, despite the unavoidable freight handicap. Definite assurance that price cutting has gone its limit has heartened jobbers and stimulated sales of these goods. A livelier inquiry for automobiles has had a beneficial influence.

The active inquiry for rubber belting earlier in the year has quieted somewhat. Most of the new factories have been outfitted and prices have shaded off a little. Mining interests are stirring somewhat, the impression gaining ground that before many months there will be a sharp demand for the metals, operations will be steadily resumed, and considerable belting will be needed. Oil-drillers are buying a fair amount of rubber belting.

An excellent trade is reported in garden hose for 1922 at fair prices. One coast factory has all it can do to fill orders. There is a fair inquiry for heavy suction and discharge hose from the big oil companies. Jobbers in rubber heels and soles note a good demand and a growing appreciation of the goods. Demand for various mechanicals keeps up well on account of increasing activity in the building trades. Lately there have been many large sales of radiator hose to coast concerns making automobiles, and rubber manufacturers and jobbers report an excellent demand for tire repair stocks and automobile accessories. In druggists' sundries, which of late had been somewhat quiet, interest has been awakened, and the big chain drug stores have been adding considerably to their stock of staples. Anticipating a good holiday trade, dealers in rubber toys and novelties are also doing much shopping.

Jobbers report a good outlook for rubber footwear in the fall and winter, and are adding to their orders for the 1922 spring stock. There is still a good inquiry for mining, lumbering, and cement workers' shoes, as well as heavy boots for fishermen and irrigation workers. Orders for tennis and sport shoes hold up well in the southern section, and there is a good demand for rubbers from the northern section, where the rains set in early. The same is true regarding raincoats for men and women, business being aided by the display of some new and attractive models, especially in women's rainproof garments.

LOS ANGELES AND VICINITY

Fred S. Wilson, vice-president and Pacific Coast manager for the Thermoid Rubber Co., Trenton, New Jersey, is now located at 238 Marsh Strong Building, Los Angeles, California.

The Dayton Rubber Manufacturing Co., Dayton, Ohio, has increased the sales force of its Los Angeles branch, and has recently appointed W. E. McCarthy as branch manager. Mr. McCarthy was previously sales manager for the Owen Tire & Rubber Co.

The B. F. Goodrich Rubber Co.'s Los Angeles branch is now in its new quarters in the Union Terminal Building, Seventh and Alameda streets. A considerable increase in warehouse room, better trucking accommodation, and a Southern Pacific Railway spur are some of the advantages gained by the new location. The branch will deal solely with the jobbing and wholesale trade.

The rubber industry was well represented at the Industrial and Trade Exposition held during the week of August 15 to 20, inclusive, at the new Union Terminal Building, to mark Los Angeles' promotion to tenth place in the nation's list of industrial centers. Six acres of warehouse space were devoted to the exhibits, of which the Goodyear Tire & Rubber Company of California had one of the most striking. A moving picture illustrated the process of tire making, and the Goodyear Textile Mills Co. made an exhibit of tire fabrics. Vice-president A. F. Osterloh of the Goodyear company was chairman of the manufacturers' committee of the Chamber of Commerce which sponsored the big show.

The California Cord Tire Co., 831 West Eighth street, Los Angeles, confines itself to marketing one tire, the California cord, size 30 by 3½, retailing at $20, which is made for the company by the Mid-Continent Tire Manufacturing Co., Wichita, Kansas. The California company is figuring on having its own plant on the Coast in the near future.

Paper mill owners, who formerly sent their big rolls East to be rubber covered, are now sending them to the Pacific Coast. The West American Rubber Co., 400 North Avenue 19, Los Angeles, has just covered its seventh roll, one of 4,000 pounds, and will shortly take on a heavier one. Some of the rolls weigh 6,000 pounds. The company has been doing very well with oil-pump valves and various mechanicals, and has also been making, among other specialties, many large rubber fishes for the motion picture industry.

SAN FRANCISCO AND VICINITY

Pawling & Harnischfeger Co., Milwaukee, Wisconsin, reports that its San Francisco office address has been recently changed from the Monadnock Building to 32 Beale street. R. M. Taylor, district manager for the Pacific Coast, has his headquarters at the new address. J. McFerran Taylor is a new member of the Pacific Coast sales force.

A branch house and warehouse has been opened at both Los Angeles and San Francisco by the Howe Rubber Co., Inc., Cleveland, Ohio, both under the management of C. A. Mullen.

Gilbert E. Foy, a former salesman, has been appointed manager of the San Francisco branch of The Spreckels "Savage" Tire Co., San Diego, California.

The Pioneer Rubber Mills, Pittsburg, California, and with main offices at 68-70 Sacramento street, San Francisco, is now operating at full capacity its recently completed unit solely devoted to the production of molded garden hose. The building is 85 by 240 feet, and is equipped to turn out 37,500 feet of hose daily. The old molding process has been discarded and a new hydraulic press has been installed that assures a practically unblemished product for every 500 feet cured in the big machine. The company has 300 men at work, and all its departments are working to full capacity.

The United States Rubber Co.'s San Francisco branch has received very encouraging reports from distributers, and hose and tires have been running particularly strong. The general average of sales is very much better than a year ago.

The Wellman-Seaver-Morgan Co. has made many sales of machinery recently to rubber mills in the coast district, and the officials report prospects as excellent.

The Coast Tire & Rubber Co., which recently finished the first unit of its plant at East 12th street and 48th avenue, Oakland, California, besides a large output of tubes and flaps, is making 140 tires daily, mostly cords, ranging from 30 by 3½ to 40 by 8. When the daily output reaches 500 the management intends to begin the building of the second unit of the plant.

SOUTHWESTERN NOTES

The plant of the Arizona Asbestos Association at Chrysostil, Arizona, which supplied considerable material to rubber manufacturers specializing in brake linings, has been closed, owing to a considerable falling off in orders. Very few asbestos mines in Gila county are reported to be busy, the impression being that buyers have accumulated more than enough to satisfy their needs for a long while.

Plans are being considered by Arizona and California cotton growers for sending their large surplus of "white gold," for which they had expected a much larger demand from the rubber tire and textile manufacturers, to the idle mills in Czecho-Slovakia. The finished product would then be marketed in England and the proceeds, less cost of weaving, etc., would accrue to the southwestern cotton raisers. The plan was recently outlined by Charles F. Wood, vice-president of the Warrant Warehouse Co., Birmingham, Alabama, to a group of planters and bankers in Los Angeles.

An excellent exhibit of guayule, chicle, and castilloa gums was made by the Government of Mexico at the recent Industrial and Trade Exposition in Los Angeles, and a strong appeal was made for investment in rubber growing and manufacturing in the southern republic.

Arrangements have been completed by the Dayton Rubber Manufacturing Co., Dayton, Ohio, for warehouse accommodations in Dallas, Texas, where a full stock of tires will be carried. C. K. Callaway, formerly with the Brunswick Tire & Rubber Co., Chicago, Illinois, is in charge of the Dallas branch.

Ford Dix II, representing the Howe Rubber Co., Inc., Cleveland, Ohio, is now covering Texas, Arkansas, and Oklahoma.

NORTHWESTERN NOTES

The Olympic Tire & Rubber Co. announces a change of address from 217 Lyon Building, Seattle, to the plant at Kent, Washington. B. G. Nelson is president of the company.

UNITED STATES TIRE CO. DEVELOPS NEW TIRE

Car designers are finding it desirable to build cars closer to the ground, thus getting a lower center of gravity with increased ability to stay on the road at all speeds. Following this innovation the United States Tire Co. has developed a 31 by 4 straight-side Royal cord tire, a size heretofore unknown among cord tires. The tire is to be mounted on a 30 by 3½-inch straight-side rim, having the standard 3½-inch straight-side cross-sectional contour. The rim will be the same as the 32 by 3½-inch straight-side rim except that it will be 23 inches in diameter instead of 25 inches.

This tire is in no way a substitute for the 31 by 4 clincher tire, nor can it be mounted on a 30 by 3½-inch clincher rim. It is of interest as being an extension of the straight-side principle into those sizes of tires which heretofore have been almost exclusively of the clincher bead type. By changing clincher rims to straight-side, cars can be equipped with 4-inch cord tires, and this is often necessary when there is particularly heavy service. Many rim and wheel manufacturers are now preparing to furnish 30 by 3½ straight-side equipment to interchange with their standard 30 by 3½ clincher demountable rims.

The Rubber Trade in Great Britain

By Our Regular Correspondent

THE exceptionally hot and dry summer we are experiencing has been altogether against the sale of the accumulated stocks of waterproofs and raincoats. Moreover, there can be no activity in the sale of garden hose when the authorities forbid its use.

THE PLANTATION RUBBER SITUATION

These are insignificant matters in comparison with the immediate future of the rubber planting industry, a topic that is receiving serious consideration now that the Rubber Exhibition is out of the way. It has been pointed out by an authority that there is no other great industry producing a raw material in which one class of owner forms 75 per cent of the whole, or in which one nationality—British—is in the position to control nearly three-quarters of the world's production.

With regard to decreased output the Rubber Growers' Association did not propose a 25 per cent restriction on the 1920 output, but a similar reduction on the estimated output for 1921, and allowing for the average normal increase on the total area held by both old and young producers it means in reality a reduction of 18 per cent, which, under the circumstances, is of little or no use. There has been a tendency to say that no universal policy of restriction is possible, owing to the diversity of interests involved. Although the small native producer markets rubber of quality inferior to that of the large companies, yet his producing costs are so much lower that he is not faced with the bankruptcy which threatens the producer of superior rubber who cannot expect to get his costs down to 4*d*. a pound.

It now remains to be seen what response will be given to the new scheme for the salvation of the industry, an outline of which is published elsewhere in this issue. The plan is, in effect, a thoroughgoing valorization scheme, whereby the Rubber Producers' Corporation, Limited, is to be formed with a capital of £2,000,000. Whatever its merits or defects it is drastic enough.

It may be taken that this attempt to exercise effective control upon output will cause a "ring" whose operations will be looked upon with suspicion by outside planting interests. The consumers' interests would seem to be jeopardized, not perhaps at present, but certainly when demand does overtake supply, because the corporation will be in a position to exercise monopoly powers to the detriment of the consumer. As a means of support to the weaker companies by the stronger in the present acute state of depression there is nothing against it, as it will prevent land from going out of production. It is only with the continuance of such philanthropy when normal conditions are restored that resentment will probably be felt by those who look upon all trusts and combines in trade as inimical to the general welfare of the country.

TIRE AND RECLAIMING ACTIVITIES

On the manufacturing side the principal item of note is a distinct revival in the tire branch. The Dunlop works at Birmingham have now been put on full time and in other works there is decidedly more doing. To some extent this may be attributed to the export of pneumatics to America, emissaries having been over to get details regarding the American requirements in cord tires, those now being supplied by some of our firms apart from the Palmer company. This company's cord tire, which dates back eighteen years, is now being made after a new type called the "Flexicord."

The reclaiming business shows decided signs of improvement. The Rubber Regenerating Co., Limited, Trafford Park, Manchester, after being closed for a period, restarted on full time in the middle of July, while the Xylos Rubber Co., Limited, a near neighbor which never came to a full stop, reports a decided improvement in business.

THE ACTION OF MANGANESE ON RUBBER

That the origin of tackiness in raw rubber may probably be due in many cases to the presence of manganese compound was contended by G. Bruni and C. Pelizzola in an interesting paper read at the late International Rubber Conference. The figures given certainly support the view put forward by Thomson and Lewis in 1891 that manganese oxide follows soon after copper oxide as a deleterious constituent in rubber proofings, more especially those which are cold-cured.

The case of chromium oxide is at the moment receiving special attention in America, it having long been a question whether it is dangerous or not. It has been customary to test constituents of rubber mixings for manganese compounds, not so much in the case of metallic oxides like zinc, where it may occur in traces, but in regard to ochres and umbers, the latter especially being proven to contain it in quantity.

The origin of the manganese found in raw rubber appears to be two-fold, it coming either from the soil or from traces of permanganate used as a disinfectant. All possessors of old textbooks on analytical chemistry know of the warning given against using burettes with rubber connections for standard permanganate solutions, and the recommendations to deodorize rubber goods by permanganate solution have only emanated from people ignorant of the chemistry of rubber. With regard to the presence of manganese in the ash of raw rubber, no doubt careful testing will find that it is quite widely distributed in the soil. Like the so-called rare element, titanium, which careful examination has shown to be widely distributed in the earth's crust, manganese and other metals may be discovered albeit in infinitesimal amount by the dissector's scalpel.

I am reminded here of the recent investigation into the composition of coal ash by Sinnatt. Manganese in greater or lesser quantity has been found as an almost invariable constituent and it has been plausibly advanced that it acts as a catalytic agent in the case of certain coals notorious for liability to spontaneous combustion, the amount of manganese in such coals having been found high.

HEAT EFFECTS

Considering the number of cases of fire, whether by spontaneous combustion or not, during the hot summer, the rubber industry has been surprisingly immune. In France the large celluloid factory at Epinay took fire and was burned out on July 12. On the following day a large government dump of 500 tons of scrap rubber at Iver Bucks was destroyed by fire, and as it was presumably vulcanized it is not surprising that the firemen had to wear gas-masks. It is a coincidence that when this rubber was previously stored at Wapping on the Thames estuary last October it was on fire. On this occasion three firemen died and several other men were seriously injured.

On July 23, an outbreak of fire, the cause of which is unknown, occurred at the old established rubber works of J. L. Hancock, Limited, London, E. C. Two buildings of four floors, one 120 by 60 feet, and the other 60 by 40 feet, were involved, though the damage done was not very serious.

SOCIETY OF CHEMICAL INDUSTRY

The annual meeting of the Society of Chemical Industry was held at Montreal, Canada, August 29 to 31, and those members who attended derived much pleasure and instruction from the elaborate program prepared by the Montreal and Toronto Sec-

tions of the Society. On the conclusion of the Canadian visits the members traveled to New York City, to be entertained by the American Chemical Society and attend its meetings. They will also have an opportunity to visit the National Exposition of Chemical Industries in New York City. Among the nominations for new members of the Council is W. A. Williams, works manager of the North British Rubber Co., Limited, Edinburgh, Scotland.

THE MANUFACTURE OF DIPPED GOODS

No doubt many have read with interest the article by John Hadfield in THE INDIA RUBBER WORLD of July 1, on this subject. This branch is not widely distributed in Great Britain, only four or five of our large works touching it, and though there are one or two small works engaged, there are certainly no numerous small manufacturers as appears to be the case in America. At the time when I was in close touch with this branch—now a good many years ago—all joints in balloons, etc., were made by machine hammering, the girls in attendance having cotton in their ears, owing to the deafening noise. Now, the dipping process is generally employed.

Under the heading of cement it is stated that the solvent employed is 56 to 58-degree naphtha. I am not just clear as to the meaning of degree in this connection, or as to the origin of the naphtha, whether coal, tar, petroleum or shale. But it is stated that this naphtha should completely distil under 150 degrees F. This seems a very low point and I cannot help thinking that 150 degrees C. is intended.

The reference to the use of transparent first latex rubber reminds me of a conversation I had with Kelway Bamber on the subject, at the first London Rubber Exhibition, and of a pamphlet he gave me dealing with its potential advantages in this branch of rubber manufacture.

The manufacture of household rubber gloves is a larger business in America than in England because the American woman has been accustomed to do considerable of her own housework in rubber gloves for years, whereas, a similar state of affairs did not arise here until war work at high rates of pay reduced the supply of domestic servants to a minimum. To the best of my knowledge the cotton glove is more popular here, but that is by the way.

With reference to the vapor cure nothing is said as to the materials of the curing chamber or as to how the uniform temperature of 180 degrees F. is maintained.

THE RUBBER CLUB OF GREAT BRITAIN, LIMITED

Just a year after the project was first suggested in Manchester, the Rubber Club has been registered as a company limited by guaranty. The main obstacle to the progress which was anticipated by the promoting spirit has been the absence of support accorded by the principal manufacturers and it remains to be seen how their abstention from membership will affect the progress and future of the club. The council which will manage the affairs of the club is composed as follows: A. B. Cook, Anderson, Anderson & Anderson, Limited; J. H. C. Brooking, St. Helens Cable & Rubber Co., Limited; G. E. Watson; T. B Burrows, Wm. Somervilles' Sons' Rubber Co., Limited; O. Latham, raw rubber merchant; W. G. Abbott, Abbott, Anderson & Abbott, Limited; F. C. Jones, Reliance Rubber Co., Limited; H. W. H. Standring, journalist; J. L. Lake, rubber manufacturers' agent; W. H. Hatton, Premier Waterproof & Rubber Co., Limited.

THE LATE W. H. BATES

The death of W. H. Bates, one of the oldest rubber manufacturers, will be regretted by a wide circle of friends, though, owing to his advanced age of 88 years, he had naturally not taken an active part in the business of the well-known firm of W. & A. Bates, Limited, St. Mary's Mills, Leicester, of which he was the founder in 1863.

BRITISH NOTES

J. W. Reeves, formerly connected with Rubber Products, Limited, has recently become associated with Cooper & Layman, Limited, 30 Mincing Lane, London, E. C. 3, England, and will have charge of the latter company's rubber department.

Crude rubber represented one of the leading exports from Liverpool to the United States during the years 1919 and 1920. In 1919 the number of pounds exported is estimated at 7,247,838, with a value of $2,985,350. In 1920 the amount was 2,206,856 pounds, valued at $1,199,424.

Press reports state that the United Malaysian Rubber Co., which acquired stock of the Malaysian Rubber Co. of New Jersey in 1910, has been forced into liquidation with a deficit of almost £2,500,000. The company, formed ten years ago at the height of the rubber boom, imported and exported Eastern produce, doing business in Singapore, England and America. Losses incurred in Singapore are reported to be the cause of the failure.

The judges of the Rubber Growers' Association prize competition for new and extended uses of rubber, report that they are unable to announce the awards until tests have been made to prove or disprove the practicability of certain suggestions that were entered in the competition. The 2,000 entries have necessitated many meetings and careful consideration by the judges.

ENGLISH MOTORCYCLES DISPLAY NEW FEATURES

Many of the new English motorcycles have interchangeable wheels. In other cases where the wheels are not actually interchangeable, provision is frequently made to allow the rear wheel to be readily withdrawn, the knock-out rear spindle system being utilized for this purpose.

An increasing tendency is also noted toward using tires of larger cross section for the heavier classes of cycles. At present the largest standard wheel and tire size is 28 by 3 inches, but in the heavier tires it is probable that 3½-inch tires will not be unusual in the near future. The 26-inch diameter wheel is, however, the usual size with a 2½-inch tire for medium-weight machines. For the lightweights a good many makers use 24-inch by 2¼-inch wheels and tires, though quite as many fit wheels of 26-inch diameter.

EXTRACTS FROM THE REPORT OF THE RIVERSIDE (SELANGOR) RUBBER CO., LIMITED

The Riverside (Selangor) Rubber Co., Limited, 46 Charlotte Square, Edinburgh, has submitted a balance sheet for the year ended December 31, 1920. The present firm was incorporated March 17, 1920, and took over, as a going concern, the affairs of the former company of the same name. From the report of this company the following items are taken:

The rubber estates of the firm are in the Federated Malay States, and the total acreage planted represents 2,206.50 acres. It was estimated that the crop for the year 1920 would be 530,000 pounds of dry rubber. In accordance with the recommendations of the Rubber Growers' Association, the crop was restricted by 25 per cent as from November last. But for this restriction, the estimate would probably have been secured. The total crop collected (after allowing for loss of weight in transit) was 510,932 pounds.

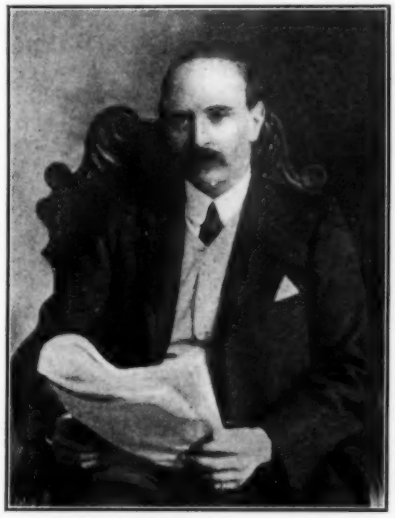
For the purpose of comparison with the results of the previous five years of the old company, the following statement is given:

Year	Crop lbs. dry rubber	Gross average price realized per lb. s. d.	Cost of production f.o.b. per lb. s. d.	Selling charges, including freight and insurances, per lb. d.	Administration expenses, including directors' fees, per lb. d.	Cost of production "all in," per lb. s. d.	Profit for year before paying income tax £.
1915	330,756	2/ 7.85	8.58	1.69	.70	10.97	29,208
1916	405,520	2/ 5.65	9.60	1.28	.69	11.57	31,468
1917	372,000	2/ 1.68	10.30	1.51	.77	1/ 0.58	21,294
1918	326,852	1/10.30	1/ 0.24	1.18	.94	1/ 2.36	11,744
1919	376,310	2/ 1.71	1/ 0.82	1.15	.74	1/ 2.71	17,595
1920	510,932	1/ 2.39	1/ 0.29	1.02	.73	1/ 2.04	1,240

The International Rubber Exhibition

By George M. Naylor[1]

PRACTICALLY every nation in the world in the tropics, or possessing colonies in the tropics, was represented at the London rubber exhibition this year, the principal government exhibitors being: British Malaya, Ceylon, North Borneo various British African colonies, and Egypt; the Philippines, Netherlands East Indies, French West Africa, French East Africa, and Siam; Belgian Congo, Portugal, Madagascar, and Brazil.



PROFESSOR WYNDHAM R. DUNSTAN, C. M. G., LL.D., F. R. S., VICE-PRESIDENT, FIFTH INTERNATIONAL RUBBER EXHIBITION

Other firm exhibits represented estates agents, rubber manufacturers, makers of rubber machinery, reclaimers of rubber, dealers in chemicals and rubber substitutes, and dealers in various tropical products. A new process for preparing crude rubber was also shown.

Probably the most interesting of the government exhibits from the crude rubber standpoint was that of the Netherlands East Indies. There were pamphlets showing the research work done at the Central Rubber Station, Buitenzorg, Java, and translations of one or two lectures by Dr. de Vries. A series of photographs showed the Central Rubber Station. A display consisting of a piece of ribbed smoked sheet, a piece of the sheet after breaking down, a third piece after compounding, and finally some vulcanized test rings, conveyed the idea that, as far as the final product is concerned, all effort expended in making a nice-looking sheet is wasted. Although it may seem absurd to the rubber manufacturer, this is actually news to some estate managers and to many rubber brokers in Singapore.

The method of testing samples of rubber and several graphs used for plotting the results of the tests were exhibited. The progress made by estates in the Netherlands Indies in producing a uniform rubber both in sheet and crêpe was illustrated by several charts showing the variability in curing rate before, and the uniformity in curing rate after adopting the standard method recommended by the Central Rubber Station at Buitenzorg. The degree of uniformity obtained by separate and grouped estates, as shown by charts illustrating the results of tensile tests, was quite remarkable.

In this the Netherlands East Indies are much in advance of British Malaya, for although the Agricultural Department of Malaya recommends various methods in the different stages of rubber preparation it does not recommend any one uniform method, with the result that practically every British estate varies in the method of rubber preparation.

Crêpes of various degrees of color were shown; first, a standard pale crêpe as accepted by the market; second, a crêpe prepared on a manufacturer's estate for his own use illustrating the disregard of color. Following this were various "off color" crêpes, some from improper handling of the coagulant, others from trees tapped after resting, causing the latex to coagulate too slowly—and brown crêpes made from lump and scrap.

An exhibit of special interest to crude rubber buyers and estate men was the display of several samples of defective crêpe and giving the following reasons for the defects:

COAGULATION FAULTS: (1) Streaky crêpe caused by oxidation of serum on the surface of the coagulum which was due to too slow handling of the rubber. (2) Streaky crêpe caused by allowing partially precoagulated latex to stand too long before adding coagulant, also by adding improperly diluted acid, or improper mixing of diluted acid with the latex.

FAULTS DURING ROLLING: (1) Discolored from rolls. (a) Rolls allowed to become rusty—a rare fault. (b) Crêpe run in a machine which had been running empty for some time, creating fine iron filings. These are run in the crêpe and on second rolling become throughly pressed in, causing gray stripes in the crêpe. (2) Crêpe containing cotton from native's clothing becoming entangled in the mills.

DRYING FAULTS: (1) Slightly streaky crêpe caused by unevenly rolled and unevenly dried crêpe. (2) Pink, blue, yellow and green spotted crêpe, caused by insufficient drying space, resulting in the crêpe being taken down before thoroughly dry and lying folded up, which almost invariably causes the development of micro-organisms showing in the small colored spots so often seen in pale and palish crêpes.

COLORED SPOTS IN CRÊPE: (1) The spots mentioned above sometimes develop in wet crêpe still hanging, and unless the remainder of the crêpe is removed from the shed at once and the shed disinfected these spots spread throughout the entire lot in a few hours. (2) Red streaks caused by the saliva of a native chewing betel nut. (3) Red discoloring caused by red lead from the pipes during crêping. (4) Dark streaks found in lump scrap crêpe which has been allowed to stand and heat, or overoxidize before crêping. These streaks often become soft and sticky and gradually spread throughout the rubber. (5) and (6) A clear lump crêpe and a red discolored lump crêpe (cause not given) which give the same results in testing for tensile strength. (7) Oil-streaked crêpe caused by oil from bearings resulting in very uniform vulcanization. (8) Sticky brown streaks caused by oil containing copper from bearings. This stickiness will gradually spread throughout all the latex with which it comes in contact.

An exhibit similar to the preceding one displayed the various defects in ribbed smoked sheets and the reasons for these imperfections.

Air bubbles in the sheets are caused by: (1) Insufficient mixing of coagulant with latex. (2) Prematurely coagulated latex. (3) Failure to properly skim foamy substance from the surface of the latex. (4) Insufficient dilution of latex causing fermentation of proteins during the drying process which in turn creates gases resulting in bubbles.

Dark and light patches in sheet are caused by surface discoloration of coagulum.

Blistered sheet caused by too high temperature in the smoke house.

Sheet containing sand. This is due to the removal of all undergrowth as well as dead leaves from estates, leaving bare ground, resulting in sand being blown into the latex cups.

Barky sheet due to insufficient attention to latex strainers.

[1]The Fisk Far East Limited, Singapore, S.S.

Sheets with light streaks across the center, due to insufficient turning of the sheets in the smoke house.

The fact that good appearance of rubber does not guarantee good quality was demonstrated by several lots of the best pale crêpe. One lot containing .02-gram of copper sulphate added to latex will deteriorate within two years. Another crêpe of the same appearance containing .2-gram of copper sulphate will become a sticky mass within a year. Another lot coagulated with hydrochloric acid, a very slow-curing rubber, will soon become a sticky mass. There were sheets coagulated with alum—as is the case on most native estates—and very elastic and strong on hand pulling but showing abnormal vulcanizing properties.

Latex coagulated by electricity without acid was hardly satisfactory, as a part of the coagulum—15 to 20 per cent, precoagulated—has the appearance and properties of lump crêpe and the remainder although of appearance and quality of average fine pale, shows no improvement over acetic acid coagulation.

A display of rubber prepared by various methods included: slab rubber coagulated by acetic acid and cut into blocks giving good tensile tests; rubber prepared after the fine hard Pará method (There were several balls of this type displayed which were of the same appearance as Brazilian Pará. The Netherlands Government is attempting to get all native estates to prepare their rubber after this method rather than the usual alum coagulation, as the equipment necessary is inexpensive.); unsightly alum-coagulated native sheets prepared after the usual native fashion; rubber of the appearance of clean unsmoked sheet prepared without acid by slowly revolving a large broad drum, the bottom portion of which comes in contact with a pan of latex, the upper portion passing through a current of warm air.

Next came several illustrations of bark and root diseases and their cures, such as pink disease, mouldy rot, white ants, boring insects, etc. Following this was a display of Hevea tree trunks showing various ideas in tree tapping from the old "herring-bone" method to the present method of one-third or one-quarter alternate-day tapping allowing six or eight years bark removal.

Another exhibit was a bale of rubber packed in straw matting sewed together with a coarse twine and bound with metal straps, the total cost including labor being given at 5/3.

At one side was a display of gutta percha of excellent quality with a chart showing the relative values obtained from various methods of production, the most approved method being that of obtaining the gutta percha by grinding up the leaves and subjecting them to an extraction process.

The exhibit of the Government of Malaya, while fairly extensive, did not compare to that of the Netherlands East Indies, and consisted of samples of pale crêpe, ribbed smoked sheet, and slab rubber both in slab and crêpe form. There were displays of root, bark and leaf diseases and pests of the rubber tree, and various methods of tapping were illustrated by sections of tree trunks.

The Government of Ceylon's exhibit was similar to that of Malaya, showing samples of thick Ceylon crêpe and scrap grades. Several rubber tree stumps and trunks were in evidence, illustrating the effect of various diseases as well as methods of tapping.

The next government exhibit in the order of interest from the standpoint of crude rubber, was that of Brazil. Although an extensive exhibit, rubber held only a minor place, consisting of displays of fine hard Pará in form of "Pigs" and "Knapsacks." The remainder of the exhibit displayed all of the principal products of the country, including cotton, coffee, sugar, tobacco, timber, hides, wool, meats, minerals and manufactured goods.

Among the exhibits of estate agents those of Harrisons & Crosfield, Limited, Francis Peek & Co., Limited, and Guthrie & Co., Limited, were of great interest. These exhibits displayed samples of fine pale, ribbed smoked sheet, and scrap crêpes from their various estates, which were of prime appearance. Other displays consisted of tree diseases and cures, illustrations of tapping, implements and tools used on estates, models of estate bungalows and smoke houses, estate machinery, etc., and various other tropical products.

Much interest is being shown on the part of crude rubber producers in the development of rubber roadways. An exhibit showing the methods of paving and the progress made was the subject of much discussion, as it is the hope of rubber planters that some new and extensive use of rubber will soon be found to insure the consumption of the large output now being produced.

FOREIGN TARIFFS

FRANCE

FURTHER tariff increases which apply to the importation of goods into France have been recently made, and the "coefficient" plan has again been made use of.

The coefficient is the figure by which the original rate of duty must be multiplied to find the new rate of duty. For example, the original rate of duty on belting, hose, and other mechanical rubber goods was 70 francs per 100 kilos. The revision of July, 1919, applied the coefficient of 1.5 to this making the total rate 70 times 1.5=105 francs per 100 kilos. The fresh revision applies the coefficient of 4.0, raising the rate to 280 francs per 100 kilos.

The following includes the most important items of interest to the rubber industry:

No. in French Tariff	Article	Tariff Duty, 100 Kilos N. Francs	Coefficient of Increase: Former	Coefficient of Increase: Present
ex 620	India rubber and gutta percha manufactures:			
	Sheets of india rubber, pure, not vulcanized	20	1.1	1.7
	Threads of vulcanized india rubber more than 3 mm. in thickness or diameter	20	1.3	2
	Elastic tissues	200	1.7	2
	Rubbered tissues in pieces	135	1.9	3.3
	Made-up articles of rubbered tissues weighing 400 grams or less per square metre and having 44 threads or more in warp and weft in a square of 5 mm. side	450	1.7	2
	Clothing, accessories of clothing and made-up articles other than those included in the following paragraphs:			
	Dress shields	250	1.4	1.8
	Braces, garters, stocking or sock suspenders, belts of threads of textiles, other than natural or artificial silk	250	1.4	1.8
	Of threads of natural or artificial silk, combined or not with other materials	300	1.4	3
	Other	250	2	3
	Special rubbered tissues for cards, without the teeth	70	2.4	2.6
	Footwear	100	2.1	2.6
	Treads, air tubes, or pneumatic tires, blocks, solid tires for vehicle wheels rough, worked, or finished	80	1.3	1.5
	Treads air tubes, or pneumatic tires, covers for cycle wheels, rough, worked, or finished	220	1.3	Same coefficient as for detached cycle parts
	Belting, hose valves, and other articles of india rubber or gutta percha, pure or mixed, flexible or hard, combined or not with tissues or other materials	70	1.5	4
620 bis	Manufactures of asbestos or amianthus:			
	Paper or board	50	2	2.7
	Threads and cords, combined or not with other materials	60	2.3	3.3
	Plaits, tissues and other manufactures with or without additions of other materials.	75	2.3	3.3
	Lace of asbestos	..	2.3	Same coefficient as for cotton lace

Articles not elsewhere mentioned, of asbestos, paper, or tissue of asbestos, namely, tissue of rubbered asbestos, articles of rubbered asbestos, gloves, clothing, caps, masks, boots and shoes, cushions of asbestos tissue (and also rubbered), all these articles, even combined with other materials, are dutiable under No. 620 bis, unless they become liable to higher duties by reason of such combination.

ITALY

The new customs tariff of Italy, which went into effect July 1 last, is based on the law submitted by a Royal Commission in 1913,

which laws were later modified in August, 1920, and in January, 1921. Provision has been made, however, in the new tariff, for an increase of these basic rates by a series of "coefficients of increase" which indicates the figure by which the duty is to be multiplied to determine the amount to be added in order to arrive at the total duty payable. The new duties are subject to a surtax when payment is not made in gold.

Category XLIII.—Rubber and Gutta-Percha

Tariff No.	Articles	Import Duty (Gold Lire) Lire c.	Coefficient of increase
826	Rubber:		
a	Raw	Free	..
b	Re-manufactured	20.00	..
c	Mixed with other substances not vulcanized 100 *kilogs.*	50.00	..
827	Rubber sheets and plates:		
a	Cut ....100 *kilogs.*	80.00	0.2
b	Other:		
	1. Combined with tissues or with tissues inserted ....100 *kilogs.*	70.00	0.3
	2. Containing metal threads or metal gauze 100 *kilogs.*	40.00	0.3
	3. Not specially mentioned....100 *kilogs.*	60.00	0.2
828	Rubber tubes:		
a	Of cut sheet....100 *kilogs.*	100.00	0.2
b	Other:		
	1. Combined with tissues or with tissues inserted ....100 *kilogs.*	80.00	0.3
	2. Containing metal threads or metal gauze ....100 *kilogs.*	50.00	0.3
	3. Not specially mentioned, except those for inner tubes of tires....100 *kilogs.*	70.00	0.2
829	Rubber cords, even combined with textile materials ....100 *kilogs*	60.00	0.2
830	Threads of rubber of a thickness of:		
a	Up to 3 mm....100 *kilogs.*	150.00	0.1
b	More than 3 mm....100 *kilogs.*	100.00	0.1
831	Disks, even if perforated, bands and valves, or tubes of rubber:		
a	Of cut sheets....100 *kilogs.*	110.00	0.2
b	Other:		
	1. Combined with tissues or with inserted tissues ....100 *kilogs.*	90.00	0.3
	2. Not specially mentioned....100 *kilogs.*	80.00	0.2
832	Tires and covers of rubber for vehicle wheels:		
a	Combined with metal ....100 *kilogs.*	60.00	0.3
b	Other, even if combined with tissues 100 *kilogs.*	80.00	0.3
833	Mats (*baderne*):		
a	Combined with metal....100 *kilogs.*	60.00	0.3
b	Other ....100 *kilogs.*	80.00	0.3
834	Pneumatic tires and inner tubes, for vehicle wheels, even combined with tissues 100 *kilogs.*	100.00	0.1
835	Transmission belts of rubber, combined with tissues or with inserted tissues..100 *kilogs.*	80.00	0.3
836	Carpets of rubber:		
a	Combined with tissues or with inserted tissues ....100 *kilogs.*	70.00	0.3
b	Other ....100 *kilogs.*	60.00	0.2
837	Rubbered tissues, in the piece:		
a	Of silk or mixed with more than 50 per cent. of silk	Duty on the silk tissue according to kind.	..
b	Other	Duty on the tissue according to quality increased by 20 lire per 100 kilogs.	..
	Tissues consisting of several layers, joined by layers of rubber, in the composition of which tissues of different textile materials enter, are classified as rubbered of the most highly-taxed tissue of which they are composed.		
	Tissues, unbleached or bleached, covered with colored rubber, are not considered as dyed.		
838	Elastic trimmings, ribbons, galloons, bands, nets and tissues:		
a	Mixed with vegetable textile materials 100 *kilogs.*	140.00	0.3
b	Other	Duty on trimmings, ribbons, galloons, bands, nets and tissues of the textile material of which they are composed.	
839	Wearing apparel and traveling requisites, of rubbered tissues:	Duty on the rubbered tissue of which they are mainly composed, increased by 25 per cent.	
840	Manufactures, not specially mentioned, of rubbered tissues:	Duty on the rubbered tissue of which they are mainly composed, increased by 25 per cent.	
841	Gloves of rubber:		
a	Weighing 50 grams or less per pair *kilog.*	4.00	0.2
b	Other, including parts of gloves....*kilog.*	2.50	0.5
842	Cakes and pieces of india rubber, for erasers, even with wooden sheaths....*kilog.*	80.00	0.1
843	Manufactures, not specially mentioned, of rubber:		
a	Of cut sheets....*kilog.*	150.00	0.2
b	Other ....*kilog.*	90.00	0.3
844	Ebonite:		
a	In sheets or in thin plates....*kilog.*	80.00	0.3
b	In cylinders or tubes....*kilog.*	100.00	0.3
c	Manufactures, not specially mentioned.*kilog.*	150.00	0.3
845	Gutta percha:		
a	Raw	Free	..
b	In sheets or thin plates of a thickness of:		
	1. 0.5-mm. or more....100 *kilogs.*	60.00	0.2
	2. Less than 0.5-mm....100 *kilogs.*	100.00	0.2
c	Manufactures, not specially mentioned 100 *kilogs.*	120.00	0.3

AUSTRALIA

The changes in Australian import duties, which became effective June 30, 1921, are as follows: galoshes (Item No. 328) have a general rate of duty at two shillings a pair, and preferential rate of duty one shilling and sixpence a pair. These articles, ad valorem, have a general and preferential rate of duty of 35 per cent and 25 per cent respectively. Under Item No. 332 rubber stoppers or corks are omitted, while subhead (C) is amended to read "Floor covering and floor and carriage mats of rubber, on and after May 28, 1921." Under Item No. 351 (B), "brakes and transmission linings" are added.

The prohibition of April 2, 1919, against the importation of rubber-covered wire without prescribed labels has been amended. It has now been decided that a statement "Manufactured to Railways Signal Association's specification, 1919, for rubber covered wire" (or date of subsequent R. S. A. specification under which wire was manufactured) may be accepted as an alternative to the marking heretofore required.

BRITISH INDIA

The revised valuations, fixed by the Governor-General of British India, were issued May 21, 1921. Among articles classed as miscellaneous, and also wholly or mainly manufactured, were the following:

	Tariff valuation	Duty Per Cent
Pneumatic rubber tires and tubes for motor cars, motor lorries, motor cycles, motor scooters, bicycles and tricycles....	Ad valorem	20
Rubber tires and other manufactures of rubber, not otherwise specified....	Ad valorem	11

SPAIN

On the eighth of July last the new customs tariff for Spain became effective. This tariff supersedes all those previously published. Import tariff items which relate to the rubber industry are as follows:

Imports

Tariff No.		Duties 1st Tariff Pes. c.	Duties 2nd Tariff Pes. c.
	Asbestos		
28	In sheets or plates, with or without admixture of other materials (excepting rubber or metal wire), including tiles, tubes and pipes, of asbestos and cement....100 *kilogs.* G	125.00	50.00
30	Manufactured, with admixture of rubber or metal, into couplings for machines, braids, plates, belts and other articles....100 *kilogs.*	300.00	150.00
	Balloons		
	Of rubbered silk, weighing:		
712	Less than 300 kilogs....*kilog.*	1.00	0.50
713	300 kilogs. and more....*kilog.*	1.20	0.60
	Of other fabrics, varnished or rubbered, weighing:		
714	Less than 500 kilogs....*kilog.*	0.30	0.15
715	500 kilogs. and more....*kilog.*	0.40	0.18
	Rubber, gutta percha and the like		
1376	Pure, without admixture of other materials, of the natural color or red, in sheets up to 2 mm., inclusive, in thickness, not vulcanized, called "English sheet," with a specific gravity not greater than 1....*kilog.*	0.45	0.30
	Vulcanized		
1377	Threads up to 1 mm. thick....*kilog.*	6.00	1.30
1378	Threads more than 1 mm. thick....*kilog.*	10.00	5.00

Tariff No.		Duties 1st Tariff. Pes. c.	Duties 2nd Tariff. Pes. c.
1379	Elastic rings and armlets; bands up to 3 mm. thick and up to 5 cm. wide, for insulating electric wires and cables; guiding belts for the manufacture of paper and billiard-table cushions...*kilog.*	12.00	6.00
1380	Raw or washed, even if in blocks, artificial rubber and other imitations of rubber, not manufactured.....100 *kilogs.* G	5.00	1.00
	Tubes, weighing per meter		
1381	Less than 15 grams.....*kilog.*	12.00	6.00
1382	From 15 to 50 grams inclusive.....*kilog.*	11.00	3.50
1383	More than 50 grams.....*kilog.*	8.00	2.50
1384	Hose pipes or tubes, rings and sheets not included in other tariff numbers, washers, machine packing and foot-wipers ("limpiabarros") even if strengthened with textile fibers or iron, brass or other wire, and tiles for paving with or without part of other materials.....*kilog.*	7.00	2.30
1385	Transmission belts, disks and valves for machinery, and horseshoes, whether or not strengthened or combined with other materials.....*kilog.*	15.00	3.00
1386	Solid tires for carriages.....*kilog.*	11.00	3.50
1387	Tires with metal studs (armaduras).....*kilog.*	6.00	2.00
1388	Inner tubes, used or not.....*kilog.*	19.00	7.50
1389	Outer (tire) covers, used or not, with or without parts of metal .....*kilog.*	15.00	5.00
1390	Articles of rubber for hygiene, orthopedic or medical purposes, without admixture of other materials .....*kilog.*	20.00	8.00
1391	Combs, hairpins and hatpins.....*kilog.*	15.00	6.00
1392	Footwear, soles and heels, even with part of other materials except leather and skins.....*kilog.*	12.00	4.00
1393	Dress preservers of rubber, and those of impregnated fabric, covered or lined with rubber.*kilog.*	18.00	6.00
1394	Articles not included under other tariff numbers even with part of other materials.....*kilog.*	15.00	5.00
	Cut into pieces, from tires, outer covers and inner tubes:		
1395	Of less than 0.5 meter.....100 *kilogs.*	700.00	135.00
1396	Longitudinal pieces less than, 0.05 meter in width.....100 *kilogs.*	5.00	1.00
	Fabrics impregnated or covered or lined with rubber, in the piece, weighing per square meter:		
1397	More than 800 grams.....*kilog.*	21.00	7.00
1398	More than 400 and up to 800 grams inclusive.*kilog.*	18.00	6.00
1399	Up to 400 grams inclusive.....*kilog.*	15.00	5.00
1400	Elastic fabrics for boots and shoes.....*kilog.*	15.00	5.00
1401	Elastic bands with admixture of any textile fiber for garters, suspenders, braces and the like....*kilog.*	15.00	6.00
1402	The same, made up into the above mentioned articles .....*kilog.*	18.00	7.00
1403	Waterproof fabrics, made up into clothing, sewn or not*.....*kilog.*	30.00	12.00
1412	Toys and games, of rubber and the like.....*kilog.*	20.00	8.00
	Exports		
31	Tires, outer covers and inner tubes of rubber and the like, cut into pieces.....100 *kilogs.*	50.00	....

NOTE.—Covers and pneumatic tires imported separately are dutiable as follows: In the case of covers, the dutiable weight is that of the cover plus the paper wrapping (whether or not this is the exterior packing), only the weight of the packing cloth (if any) being deducted; in the case of pneumatic tires, the dutiable weight is that of the tire plus the paper box or sheath of tissue which forms the interior packing.

Packing, belting and fabrics for machinery with admixture of rubber to the extent of more than 15 per cent by weight is dutiable as rubber.

*By "waterproof tissues" are to be understood those tissues which are furnished on one or both sides with a layer of india rubber, as also those coated inside with this material. Other waterproof tissues, into the composition of which india rubber does not enter, shall be dutiable according to those tariff numbers under which they fall by virtue of their quality and condition.

MEXICO

Among Mexican import duties which have been recently modified the following item was noted: elastic webbing, of cotton and india rubber, more than 4 cm. in width, is rated at 100 pesos per kilogram. When the width does not exceed 4 cm. the duty is rated at 1.50 per kilogram.

THE RUBBER TRADE IN EUROPE

FRANCE

ETABLISSEMENTS Hutchinson report net profits of 3,439,076 francs for the business year 1920-1921 against 3,702,825 francs for 1919-1920. A dividend of 50 francs a common share and of 30 francs on preferred shares was declared. New material and installations for the factory at Langlée cost 564,520 francs.

The Société Financière des Caoutchoucs is one of the many large planting firms that have decided not to distribute dividends for the business year just ended. For 1919 the dividend had been 15 francs per share. The report for 1920 shows that the financial condition is satisfactory. Net profits were 3,377,226 francs against 4,021,656 francs in 1919, loss in exchange alone being responsible for a decrease of 555,419 francs. Toward the end of 1920 the capital was increased from 40,000,000 francs to 50,000,000 francs.

Under the name of Caoutchoucs Duc, a new firm has been formed to manufacture and deal in all kinds of rubber goods, compounds, and similar products, by-products and plastic materials. Headquarters are at Aubervilliers (Seine).

THE COLONIAL INSTITUTE AT MARSEILLES

The increasing activities of the Colonial Institute at Marseilles have necessitated the addition of a special chemical department with its own library. The building comprises several offices, the library, a spacious room for the machines and industrial apparatus, and a chemical laboratory with adjoining yard for open air research.

This laboratory has the newest equipment for the study of vegetable oils and fats, rubber, and various grains.

BELGIUM

The Société Belge Pirelli, with headquarters at Brussels, is a new enterprise that will manufacture and sell rubber goods. It has a capital of 300,000 francs.

The "Delta" is another new concern in Belgium that will manufacture rubber goods. Its headquarters are at 6, quai du Halage, Anderlecht, and it has a capital of over one million francs.

THE RUBBER INDUSTRY IN BELGIUM

Belgian rubber manufacture, while not as large as some other industries, is nevertheless of considerable importance, particularly as some articles which heretofore were imported are now being manufactured locally.

Among the large rubber companies in Belgium are "Jenatzy-Leleu," which was founded in 1913 with a capital of 1,000,000 francs; Compagnie Générale des Caoutchoucs et Térébenthins, for the exploitation of patents relating to rubber, capital 2,500,000 francs; Société Anonyme pour le Commerce et l'Industrie du Caoutchouc, capital 1,300,000 francs. The capital of the Colonial Rubber Co. at Ghent is 3,500,000 francs. Another large company is the Ateliers de Constructions Electriques de Charleroi, organized in 1904, and with a capital at present of 20,000,000 francs. Insulated wire and cables are among its products.

American automobile tires are popular in Belgium although there is considerable local manufacture. Some of the local firms are beginning to manufacture straight-side tires, in order to compete with the United States. They are also beginning to make cord tires, which are being used on trucks and heavy cars. Other sources of supply for tires are France (Michelin), Italy (Pirelli), and England (Dunlop). The latter company in particular holds a position of importance in Belgium in connection with the solid tire business.

The market for American rubber boots and shoes is somewhat restricted, due to the high rate of exchange. Rubber for industrial purposes is chiefly secured through the United States and Great Britain. The latter country also has furnished heretofore most of the rubber clothing, as well as a large part of the supply of soles and heels. Great Britain and the United States have also sent into Belgium considerable hard rubber and insulated wire, although Pirelli, the Italian company, is particularly active along these lines. Miscellaneous rubber goods, including druggists' sundries, and also rubber toys, are now being made in Belgium, although most of such articles were formerly imported.

AUSTRIAN RUBBER TRADE FOR 1920

Austrian imports of rubber and gutta percha manufactures from the United States were 270 metric tons during 1920. Exports of rubber goods to the United States, for this period are valued at $107,996. There were 1,359 tons of india rubber imported into Austria from all countries in 1920. For the same period 8,767 tons of rubber and resin substances were imported.

BULGARIA'S IMPORTS INCREASE

Imports into Bulgaria from all countries exceeded in quantity those of 1919 by more than 50 per cent. The share of the United States in these importations was, however, comparatively insignificant, as Italy represented the chief factor. Imports of rubber goods into Bulgaria from all countries during 1919 and 1920 were as follows:

	1919		1920	
	Kilos*	Leva†	Kilos	Leva
Rubber, gutta percha and manufactures	9,337	1,444,727	92,010	11,030,198

*One kilo equals 2.2 pounds.
†The normal value of the lev is $0.193.

GERMANY

The following abstracts are from "Die Kautschukwarenindustrie Deutschland," by Dr. W. Vaas, in a recent issue of the *Gummi-Zeitung*.

The rubber industry, which is of comparatively recent date, rapidly became one of Germany's foremost industries. During the 1913-1914 period 185 rubber factories gave employment to 60,000 workmen and produced goods worth 295,204,000 gold marks. The amount of crude and waste rubber consumed was 27,565 metric tons. In 1913 the exports of rubber goods, not including products of the cable industry, were 20,508,200 kilos, valued at 135,000,000 marks.

The outbreak of the war put an end to all this trade and the German rubber industry, cut off from all supplies of crude rubber, found itself in an unenviable position. Strict measures were taken to enforce the economic handling of such stock as was on hand and as was obtained somehow from the outside. Methods for regenerating were improved and renewed attention was paid to synthetic rubber.

The need for economy can best be judged when the amounts of rubber imported from the second half of 1914 to 1918 (inclusive) are known. For the second half of 1914, the quantity imported is given as 2,583 tons; for 1915, 260 tons; for 1916, 668 tons—this includes 547 tons brought over in U-boats; for 1917, 9 tons and for 1918, 2 tons; altogether 3,450 tons in 4½ years as compared with over 16,500 tons in 1913. The total amount of raw rubber brought into Germany during the war was 4,601 tons.

From August, 1916, old and regenerated rubber was carefully collected by government order and distributed as needed. The amounts thus apportioned came to 2,449 tons in 1916—August to December only; 5,449 tons in 1917 and 4,619 tons in 1918. Of synthetic rubber, 67.5 tons were delivered in 1917—July to December only; 392.8 tons in 1918, and 850.5 tons in 1919.

Naturally prices rose considerably. Hevea crêpe that in July, 1914, had cost 4.80 to 4.85 marks per kilo, rose to 25 marks in November of the same year. In 1915, 38.60 marks per kilo was the price charged abroad, and in 1916 this jumped to 75.25 marks. In Germany, prices were regulated by the War Ministry and up to July 23, 1915, the price for hard fine Pará and first latex crêpe was 15 marks per kilo; up to November 15, 1915, it was 22.50 marks and after this, 33.75 marks per kilo.

Prices for synthetic rubber were extremely high and rose from 25 marks per kilo for hard and 27.50 marks for soft, to 45.50 and 47 marks, respectively.

Latest reports about Germany's rubber trade show that while conditions are depressing, it is expected that business will look up soon. There is a certain amount of propaganda being carried on in Holland and the Dutch East Indies to encourage the exchange of German manufactured rubber for Dutch crude rubber. Hopeful eyes are also being turned to Russia, particularly now that the Russian powers are recognizing the fact that their communistic system will not do in business.

Figures for Germany's rubber trade during the eleven months ended November, 1920, show that imports were 19,300 quintals of soft, and 200 quintals of hard rubber goods; this as compared with 38,700 quintals soft rubber goods and 1,000 quintals hard rubber goods, in 1913. Exports amounted to 26,800 quintals (180,100 in 1913), value 256,000,000 marks. Of this 25,200 quintals (166,900 in 1913), were soft rubber goods, value 220,100,000 marks, and 1,600 (13,200 in 1913) quintals, value 35,900,000 marks, of hard rubber and hard rubber goods.

Much satisfaction has been caused by the report that the Minister for Finances has agreed, subject to consent of the Reichsrat, to free mantles and wraps of rubber combined with cotton or half woolen fabrics from the luxury tax of 15 per cent. It is not thought possible that the Reichsrat will object. As far as other kinds of rubber mantles and wraps are concerned, these will continue to pay the tax.

The Rheinland commission has made out a free list of goods that are to be allowed to enter unhindered from all borders of the occupied territory. This, says the *Gummi-Zeitung*, will permit the influx of a number of luxury articles and will hit German industry hard, particularly the textile goods industry, which of course includes rubberized fabrics and goods. Other rubber goods, as atomizers, seamless articles, and hard rubber goods, appear on this free list and dealers are urged to reject them.

FOREIGN TIRES

Much indignation has been aroused here by the revelation that the Reichstreuhandgesellschaft of Berlin, a corporation founded with the aid of the Government—which owns half of the stock, is putting quantities of foreign-made tires on the local market. These tires are free from the 15 per cent luxury tax and can easily compete with the German article.

It was known that this concern had imported several thousands of pneumatic and solid tires a few months ago with permission from the Foreign Trade Bureau for Rubber. But the importations took place with the consent of the Finance and Economy Departments. When protests began to be heard, it was explained that these tires had to be imported in accordance with the Treaty of Versailles, but the assurance was given that the disposal of the tires would take place with as little harm to the local industry as possible. It was said that most of them were intended for export and the rest were to be used for the Army, Navy, etc. However, the facts are far different, as the foregoing shows, and will require a good deal of explanation.

A report from Antwerp concerning millions of American tires and tubes lying in Belgium and French ports ready for shipment to Germany, is another cause for alarm and indignation. These tires are described as being of an inferior quality seldom met with on the market. Most of the tubes consist of three and four pieces put together. The prices are extraordinarily low. The tires have no mark whatever and the covers are perfectly smooth, without any distinguishing mark. It is reported that they have been sent over by "The Surinam Rubber & Wood Plantation Co., Delaware, North America." This firm it is said, deals in crude rubber and used rubber tires.

NOTES

The Veith-Werke, Aktiengesellschaft, Sandbach, Odenwald, intends to double its capital which at present is 4,000,000 marks. This firm manufactures bicycle tires chiefly.

The Samoa Kautschuk Compagnie, Aktiengesellschaft, Berlin, has decreased its capital to 1,450,000 marks. The capital is now divided into 757 preferred shares and 698 privileged preferred shares.

The Conrad Scholtz, Aktiengesellschaft Treibriemenfabrik, Hamburg-Barmbeck, reports net profits of 362,084 marks over the business year 1920; a dividend of 15 per cent was declared. The report of this firm shows that prices for the firm's product, belting, began to drop heavily in 1919, and world competition has aided in keeping prices down, so that nothing definite can be said with regard to future prospects.

The Leipziger Gummiwarenfabrik Vulkan, Weiss & Bässler, Leipzig, has become a stock company with a capital of 4,000,000 marks.

The Deutsche Kautschuk-Aktiengesellschaft Berlin und Kamerun reports that its former possessions in the Kamerun are in the hands of the English. The trading post Duala is also exploited by English, while a French house now operates the branch at Bonaberi. At a recent meeting it was unanimously decided to build up the enterprise again at the proper time.

The Deutsche Kabelwerke Aktiengesellschaft, Berlin-Lichtenberg, has increased its capital to 22,000,000 marks. The subsidiary in England has been liquidated. The concern has several more or less large claims outstanding in England, but it is not clear how much of this will come into the company's possession.

NEW FIRMS

The Gummmi- und Verbandstoff Compagnie Goldhammer & Bernsdorf, Dresden, will manufacture and sell rubber products and bandage material.

Kölner Gummimäntel-Vertriebs Gesellschaft m. b. H., Cologne Commission agents.

A Polish factory for rubber goods has been established at Bromberg with capital of 15,000,000 marks. Most of the stock is in the hands of Poles.

D. Stroyman & Co., Berlin. Export of rubber manufactures and other articles suitable for America.

Schwalenberg & Schumacher, Dusseldorf. Rubber and asbestos manufactures.

Kleutze & Co., G. m. b. H., Hamburg. Trade in and import crude rubber, balata and gutta percha.

Firma Möllering, G. m. b. H., Hanover. Manufacture and sale of rubber goods.

Fabrik isolierter Drähte, G. m. b. H., Munich-Gladbach. Manufacture of insulated wires.

Graf & Co., Dresden. Manufacture and sale of belting and chemicotechnical products.

Hans Steinberg & Co., Hamburg. Manufacture of raincoats for men and women.

Orthopädie-Werk Habermann, G. m. b. H., Munich. Manufacture and sale of artificial limbs, bandages and orthopedic apparatus of all kinds.

Kautschuk-Industrie, G. m. b. H., Berlin. Manufacture and sale of rubber goods and trade in raw materials for rubber and cable manufacture.

Halga-Werke Werntgen & Co., G. m. b. H., Bredenscheid. Manufacture and sale of rubber goods.

Norddeutsche Gummiwaren-Vertrieb en gros Arnold Adams, Bremerhaven. Dealers in rubber goods.

Heinrich Ulrich & Co., Frankfort-on-the-Main. Wholesale dealers in rubber heels, soles and allied goods.

Vereinigte Hartgummi- Bein- und Holzwaren-industrie Gross-Bieheran, G. m. b. H., Gross-Bieheran, Hessen. Manufacture and sale of hard rubber goods of all kinds.

Verkaufsbureau der Martell-Gummiwaren, G. m. b. H., Halle a. S. Sale of the products of Gummiwerke Martell, G. m. b. H., in Halle, and also sale of rubber goods not made by Martell.

Asbest- und Gummiwerke Martin Merkel, G. m. b. H. Acquisition and continuation of the firm of the same name founded by Martin Merkel.

Ruhrtaler Gummiwarenfabrik, G. m. b. H., Hattingen (Ruhr). Manufacture and sale of rubber goods.

Firma H. Otto Hofmann, Dresden. Buying and selling sporting goods.

Deutsche Radbereifung Fritz Stoll, Dresden. To trade in rubber goods, particularly rubber bicycle tires.

Theodor Thurbahn & Co., Gummiwaren-Gesellschaft m. b. H., Berlin. Wholesale dealing in all kinds of rubber goods.

Gummiabsatz-Spezialvertrieb Johann B. Hirschmann, Frankfort-on-the-Main. Sale of rubber heels.

Firma Ernst Pfennigsdorff, Leipzig. Sale of rubber heels.

Rheinisch-Westfälische Gummi-und Gutta Percha Werke Atlantic Fröndenberg, Verkaufszentrale Düsseldorf, G. m. b. H., Düsseldorf. This firm will sell the bicycle, motorcycle and automobile tires manufactured by the Rheinish-Westfälische Gummi- und Gutta-Percha-Werke Atlantic G. m. b. H., in Fröndenberg.

Firma Peter Floss, Düsseldorf. Wholesale dealer in rubber tires.

The Rauhgummi Aktiengesellschaft, Berlin, has just been formed and is capitalized at 2,000,000 marks, to manufacture and sell rubber articles, particularly automobile tires made with a special outer covering of raw rubber. This covering is protected by German patent No. 273,159 and has been recognized in most European countries and also in Canada and Australia.

Firma Ernst Erich Eisenhauer, Hamburg. Agency for surgical and technical hard and soft rubber goods as well as technical necessaries.

Gummiwerk India G. m. b. H., Hanover. To manufacture and trade in all kinds of rubber goods.

Arnold & Schneiderheinze G. m. b. H., to manufacture and trade in rubber goods and raw and manufactured products for the rubber industry.

THE RUBBER TRADE IN THE FAR EAST

By Our Regular Correspondent

MALAYA

THE optimistic tone of American rubber publications has been eagerly noted by some local papers, while others steadfastly refuse to see any signs of improvement. Matters here seem to be going from bad to worse. Estate after estate is closing down, the latest company to cease operations being the Beverlac (Selangor) Rubber Co. Limited, which has stopped working both Beverlac and Kapar estates since August 31. In a circular issued to shareholders, crop and expenditure are given as follows:

Beverlac.—Crop 70,000 pounds on an expenditure of $25,391 (Straits currency). Cost per pound 36.27 cents.

Kapar.—Crop 100,000 pounds on an expenditure of $32,940. Cost per pound 32.94 cents. Combined cost per pound, 34.31 cents, with standard crêpe at 28 to 27 cents.

The company intends to reopen the estates as soon as market conditions justify such action.

The general rubber-planting public cannot accept the law of the survival of the fittest as Ceylon has done, and schemes for restriction and control are constantly coming up, although it is realized that without government aid nothing can be expected. Consequently there is a feeling of bitterness against the Government, particularly the Home Colonial Office.

More stress is now being laid on the need for economy and efficiency. The *Malayan Tin & Rubber Journal* publishes an interesting article, originally appearing in the *Manchester Guardian Commercial*, in which the author, who signs himself "Kedah," announces that the rubber industry is suffering from the number and inefficiency of its directors. He thinks that a few highly paid directors capable of running a big concern with success is preferable to a number of possibly superfluous persons, drawing moderate fees, in charge of smaller concerns. "Kedah" takes 100 companies with paid up capital of £20,388,600 and 488 directors and contrasts this with the well-known concern of Lever Bros., with a paid up capital of £46,966,499 and 18 directors.

To come back to restriction, *The Straits Budget* in its *Rubber*

Supplement, replying to the question whether rubber producers outside of Malaya could supply the world demand for more than a year, gives figures which it thinks ought to convince the Dutch East Indies and other countries that it is to their interest to cooperate with Malaya in restricting outputs.

The possible production of the various countries for 1921 is given as 374,000 tons. Of this Malaya, producing at full capacity, would contribute 210,000 tons. The probable consumption in 1921, has been estimated at 250,000 tons by the Rubber Growers' Association. Total stocks at the end of 1920 amounted to 310,000, the present excess, at a conservative estimate, being 150,000 tons. If the estimated consumption of 250,000 tons is correct then we have:

	Tons
Producers other than Malaya	164,000
Present total stocks—310,000 for 1920 plus 20,000 since December, 1920	330,000
	494,000
One year's consumption	250,000
Stock at end of one year	244,000
Normal stocks—safe stocks during depressed trade	180,000
Excess stocks at end of one year	64,000

Therefore, if Malaya ceased to produce, the other countries could supply one year's requirements to the world.

If Malaya produces half normal, the position at the end of 1921 will be worse than at the end of 1920.

	Tons
Stock at end of 1921 excluding Malaya	244,000
Malayan production 1921	105,000
	349,000
Stock at end of 1920	310,000
Excess over last year	39,000

CEYLON

At a meeting of the Rubber Control Committee, held in Colombo on July 5, it was decided that as only about 55 per cent of Ceylon producers had supported the restriction scheme it was impossible for the committee to discharge its functions and they accordingly resigned.

THE RUBBER PRODUCERS' CORPORATION

The news that the Rubber Growers' Association is planning a scheme to control the rubber industry for five years and that a capital of £6,000,000 will be provided for the purpose when the requisite control of 2,220,000 acres is secured, has been very coldly received in Colombo. Practically all persons in the rubber industry here are opposed to any interference with the operation of the law of supply and demand. It is pointed out first, that the Rubber Growers' Association represents only 1,150,000 acres. Then, as far as Ceylon is concerned, where restriction by 25 per cent has just proved a failure, it appears to be impossible to get a sufficient number of estates to adhere to a plan of restriction by 50 per cent.

"Generally speaking," said Mr. Burns, Chairman of the Ceylon Chamber of Commerce, to a representative of the *Times of Ceylon*, "I can say that Ceylon is rather tired of the restriction idea, because it has not been carried out either in the Straits or Ceylon. If there is to be elimination by the survival of the fittest, the probability is that Ceylon will be able to carry on and the Straits be compelled to restrict by a number of estates having to cease tapping. If Java, Ceylon and the Straits could take steps to curtail production compulsorily, then the Ceylon producers might be inclined to favor such a scheme because it would then be general. I think this is very improbable."

Mr. Burns further pointed out the unwisdom of attempting to raise prices at this time when producers were trying to rehabilitate the trade; at such a time consumers would naturally object to anything which would put up the price.

RUBBER EXPORT DUTY

About the middle of June a joint deputation of the Ceylon Chamber of Commerce and the Planters' Association of Ceylon waited on the Governor with the purpose of securing the abolition or readjustment of the export tax on rubber. At present prices, the duty on rubber amounts to an ad valorem rate of 9 per cent Since the price of rubber was below 50 cents a pound, no export duty on rubber was paid in the Straits, where a sliding scale of taxation exists. Thus the advantage that Ceylon has of a lower cost of production is neutralized to a certain extent, and to that extent the export tax makes her less able to compete with the Straits.

NETHERLANDS EAST INDIES

Until quite recently the general opinion here was not in favor of restriction. However, of late, warnings in local papers and the news that a bank to aid the rubber industry was to be established showed that the Government had fully realized the seriousness of the situation. At a meeting of the Association for the Promotion of Agriculture and Industry, held to discuss crop restriction, Mr. Hierneiss, of London, was asked to give information on the position of rubber. In his opinion restriction of 50 per cent was the only salvation. The theory of the survival of the fittest is of no use and unless something is done other sources of rubber will be developed. If rubber producers continue as at present, then it will not be the fittest that will survive, but America will take their place.

"Now what will become of the value of Eastern plantations if rubber producers do not take proper measures to protect themselves?" asks Mr. Hierneiss. "Will it be surprising if America finds that the time is arriving when she must strengthen her position in Brazil? Or will the scheme of Henry C. Pearson, Editor of THE INDIA RUBBER WORLD, to plant a rubber yielding shrub on a large scale in the United States, be carried out?"

After this talk, the Association decided to inform the Director of Agriculture, Industry and Commerce that the Association was unanimous in the opinion that the only remedy is a 50 per cent restriction together with such fixing of the market prices that the costs of normal exploitation may be covered.

According to latest information, at a meeting of representatives of rubber producing associations in the Netherlands East Indies and the Straits Settlements, held at Batavia, it was decided that identical interests make cooperation necessary, and that joint restriction of output is the only remedy. Malaya, Netherlands East Indies and Ceylon should cooperate as far as restriction is concerned. Moreover, a selling combination is also necessary for the proper control of the industry. The Rubber Growers' Association, London, and the Internationale Vereeniging voor Rubbercultuur in Nederlandsch-Indië, the Hague, will be strongly urged to form the necessary organization for control immediately.

GOVERNMENT'S GUTTA PERCHA ESTATE, "TJIPETIR"

The report of the Government's Gutta Percha Estate, "Tjipetir," for 1919 gives the following information:

The total area under gutta percha is 1332 hectares—hectare equals 2.47 acres—of which 1020 hectares are producing. The rubber acreage is 344 hectares, of which 325 hectares are in bearing. Expenditure for the upkeep of gutta percha was 57.61 gilders per hectare, 10.92 gilders being written down for manuring and 3.03 gilders for overcoming pests and diseases. Rubber cost 97.83 gilders per hectare, and fighting diseases responsible for 29.82 gilders.

Gutta percha suffered rather severely from insect pests, while rubber had to fight brown bast.

The crop of leaves amounted to 3,512,746 kilos against 3,555,587 kilos in 1918. The yield of plucked leaves was 5,452 kilos per hectare against 5,072 the year before, and 646 kilos per hectare of pruned leaves against 896 kilos in 1918.

As for rubber, the 325 hectares yielded 96,072.6 kilos as compared with 110,295.2 kilos in 1918. The yield per tree per day averaged 5.9 grams. In 1918 this was 5.6 grams.

The yield of gutta percha obtained from the leaves and the bark of the pruned branches and stem pieces was 73,181.1 kilos,

as against 67,593.6 kilos in the previous year. The entire yield of gutta percha was sold to an English concern that had been taking the whole crop of the estate for some years. The price obtained was 7.50 gilders against 7 gilders per kilo in 1918.

The cost price of gutta percha in the leaf, delivered to the factory, increased from 2.40 gilders to 2.43 gilders per 100 kilos. Costs of preparing the gutta percha were 1.07 gilders per kilo, as compared with 0.86 gilders in 1918. Total costs were 4.14 gilders per kilo against 3.83 gilders in 1918 and 6.08 gilders in 1914.

JAVA PLANTATION WORKERS' WAGES

The following statistics regarding wages paid per day to laborers on the rubber plantations of Java are taken from a recent United States Government report. One florin, it should be noted, equals, at par, 40 cents.

	Florins
Tappers, rubber	[1]0.70—0.80
Tappers, beginners	[1]0.50
Mandoers in charge of drying, smoking, and sorting rubber	30
Mandoers in charge of machining rubber	20
Skilled labor, rubber factory	15—20
Coolies, males	[1]0.30
Coolies, females	[1]0.30

[1]Per day.

SOUTH AMERICAN NOTES

THE GUIANAS

THE report of the Balata Compagnie Surinam for 1920 shows that 215,000 kilos of balata were gathered during the year, of which some was sold at satisfactory prices and other sales have since taken place.

The general situation, which adversely affected all enterprises in Surinam, also influenced the exploitation of the new undertaking Plantage Susanna's Daal, which suffered a loss of 8,261.65 gilders. The company's total profits amounted to 45,440 gilders from which losses at 42,924 gilders over the year 1919 had to be deducted.

The production of balata in Surinam during 1920 amounted to 442,071 kilos, as compared with 492,896 kilos the year before.

During the four months ended April 30, 1921, 387,190 pounds of balata were shipped from British Guiana. This is an increase of 145,423 pounds over the amount for the corresponding period of 1920 when 241,767 pounds were exported.

DECLINE OF THE BRAZILIAN RUBBER INDUSTRY

The rubber industry was one of the most important of Brazilian activities, but, not being able to compete with the oriental product, it has suffered a decline.

Year	Quantity Kilos[1]	Value Milreis[2]	Year	Quantity Kilos	Value Milreis
1912 ...	42,286,089	241,425,379	1917 ...	33,998,125	144,080,243
1913 ...	36,231,550	155,630,906	1918 ...	22,661,690	73,727,818
1914 ...	33,531,469	113,598,319	1919 ...	33,251,564	105,536,953
1915 ...	35,165,308	135,785,729	1920 ...	23,586,895	58,350,054
1916 ...	31,494,701	152,239,480			

[1]One kilo equals 2.2 pounds.
[2]One milreis equals $0.544 normal.

There are many things which have affected Brazilian rubber unfavorably—the rubber trees are scattered in a dense jungle and are long distances from ports of shipment, the gatherers must face many hardships, and often the rubber must be carried on the backs of natives long distances to places where it may be floated downstream to a port. These methods are very costly and can hardly hope to compete with the more modern methods used on plantations. Due, however, to its recognized superior quality, Pará rubber has been able to maintain a certain position on the market. In 1918 the United States bought 17,887 tons out of the 22,662 tons exported, and in 1920, 13,609 tons out of 23,586 tons exported. Great Britain came next with 6,990 tons.

BRAZILIAN NOTES

Brazil has been awarded the gold cup for the best pavilion, and the gold medal for excellency and variety of the produce exhibited at the London Rubber and Tropical Products Exhibition. The States of Amazonas and Pará have been awarded the silver cup for best-quality rubber. It is hoped here that these results will materially benefit the country, particularly the rubber lands which are in a sorry plight. To quote from a recent issue of *Wileman's Brazilian Review*:

"Foreigners and natives are migrating from the rubber land in large numbers and little by little the once prosperous cities of Pará and Manáos would seem to be falling into decay. Still the *seringueiro* contents himself with farinha and drink, and continues to tap devalorized rubber trees. The time may come when rubber will look up again, but it is doubtful whether the Amazon trade will ever witness the prosperity of pre-war years."

The Brazilian centenary is to be marked by the Brazilian Centenary Exhibition, which will be one of the most important commercial expositions to be held in 1922.

BAHIA'S RUBBER TRADE

Interest in the local rubber product centers in the variety known as maniçoba, which forms the bulk of the shipments from Bahia, Brazil. The other grade is known commercially as mangabeira. Of the last rubber crop the United States took about three quarters, while the remainder went to France and England. The quantity of mangabeira exported during 1919 was 40,062 pounds, while the amount in 1920 decreased to 11,773 pounds. The values of these shipments were $11,778 and $3,331 respectively. The amount of maniçoba exported during 1919 was 517,885 pounds, valued at $101,364. The shipment during 1920 was 101,236 pounds, valued at $37,447.—*Commerce Reports.*

PALESTINE

A correspondent of the *Gummi-Zeitung* who is at present in Palestine gives some idea of the rubber goods that could be sold in that country. Industries in Palestine are growing and an increasing quantity of mechanical goods will be needed. All kinds of tires are in demand. It also seems that a good market could be developed for most surgical and druggists' sundries, as well as for toy balls, rubber dolls, hard rubber combs, syringes, electrotechnical goods and articles made of elastic bands and fabrics. The duty on all articles in Palestine is 11 per cent ad valorem.

EGYPTIAN RUBBER TRADE

Under the name of North African Rubber Co., Raffo, Rubrigi et Cie. will engage in the manufacture and sale of rubber goods, with headquarters at Cairo. The capital is given as £15,000—Egyptian.

Imports of Automobile Tires

Imports of automobile tires into Egypt show that whereas England has formerly had almost a monopoly of this trade, and is still in the lead, American imports for 1920 were more than six times greater than for 1919. Both French and English importations, while much larger in quantity and value than those from the United States, have merely doubled for the corresponding period.

	1919		1920	
Countries of origin:	Kilos	Value	Kilos	Value
United Kingdom	76,189	$164,420	148,955	$389,590
France	31,602	91,275	61,822	202,030
United States	9,164	24,045	59,458	195,890
All other countries	12,725	28,765	20,626	65,735
Total	129,680	$308,505	290,861	$853,245

I. B. KLEINERT RUBBER CO., 719 BROADWAY, NEW YORK, N. Y., is putting out the "Grayline" moist-proof colored cases for tourist travel, designed to withstand the strains of bath-room and travel wear. These are made in staple French gray, lined with a trimming of a harmonious color. Pocket arrangements are made to meet the requirements of individual taste. These cases are of the usual protective material which characterizes the shields, sanitary goods, household aprons, etc., which have long been standard articles of this manufacturer.

Recent Patents Relating to Rubber

THE UNITED STATES

GRANTED JUNE 21, 1921

NO. 1,381,934 Compressible, non-inflatable core for tires. F. V. Roesel, Wellington, O., assignor of ⅓ to E. Miller, Perry, Ia.
1,381,996 Cushion wheel. C. J. Jackson, Galva, Ill.
1,382,033 Pessary. G. J. Wallace, Kensington, London, Eng.
1,382,216 Pneumatic tire. A. F. Morey, Oklahoma, Okla.
1,382,218 Noise-reducing typewriter-platen. W. R. Mulock, Winnipeg, Man., Can.
1,382,228 Animated sign showing tire rolling along roadway. G. R. Pyper, assignor to Pyper Animated Sign Co.—both of Salt Lake City, Utah.
1,382,231 Animated sign representing tire enclosing the words, "The Dough Tire." G. R. Pyper, assignor to Pyper Animated Sign Co.—both of Salt Lake City, Utah.
1,382,389 Pneumatic valve. M. C. Schweinert, West Hoboken, N. J.
1,382,399 Pneumatic tire with inner tension belt. J. S. Williams, Riverton, N. J. (Original application divided.)
1,382,436 Massage tool. H. Malm, New York, N. Y.
1,382,446 Garter with pocket. L. G. Warren, Westwood, Calif.
1,382,506 Running-board with interlocking mat, for automobiles. J. T. Hayne, Detroit, Mich.
1,382,537 Resilient wheel. N. L. Olson, Highland Park, Mich.
1,382,587 Toothbrush with series of elastic disks. R. M. Withycombe, Penshurst, near Sydney, New South Wales, Australia.
1,382,593 Cushioned bedpan. B. A. Arata and T. L. Mattie, Los Angeles, Calif.
1,382,600 Siphon. A. W. Schreiner, Brooklyn, assignor to Standard Scientific Co., New York—both in New York.

GRANTED JUNE 28, 1921

1,382,615 Device for painting golf-balls. A. J. Bate, Yonkers, N. Y.
1,382,630 Resilient tire. L. R. Davis, assignor to Revere Rubber Co.—both of Providence, R. I.
1,382,648 Footwear with textile-lined waterproof tongue folded inside upper, etc. F. A. Joseph, Naugatuck, assignor to L. Candee & Co., New Haven—both in Conn.
1,382,679 Water-bottle stopper. M. C. Schweinert, West Hoboken, N. J.
1,382,706 Hose supporter. C. G. Wright, Kansas City, Mo.
1,382,718 Pneumatic tire with reinforced tread. H. C. Egerton, Ridgewood, N. J.
1,382,722 Power-driven tire-pump. J. G. Graham, Tomah, Wis.
1,382,748 Footwear protector with elastic heel-strap and elastic cord in forward edge. K. Slasor, Seattle, Wash.
1,382,768 Rubber sole for boots and shoes, having stitch-receiving strip embedded in rubber at edge. G. Ferguson, Wollaston, Mass., assignor by mesne assignments to United Shoe Machinery Co., Paterson, N. J.
1,382,831 Pneumatic cushion sack. F. C. Hilker, Fort Wayne, Ind.
1,382,833 Non-slipping foot for ladder-legs. Z. L. Hurd, Nashville, Tenn.
1,382,840 Hose mender. A. Lovedahl, Aurora, assignor to Independent Pneumatic Tool Co., Chicago—both in Illinois.
1,382,844 Tire reliner. A. O. Mason, Highland Park, Ill.
1,382,918 Pneumatic cushioned tire. A. H. Kerr, Fort Worth, Tex., assignor to said Kerr, J. A. Smith, J. M. Atkinson, J. A. Dacus, and W. L. Coley, trustees for an association.
1,382,982 Vaginal syringe. E. Jeanjaquet, Swartz Creek, Mich.
1,383,036 Swimming appliance. Luther P. Sifford, Barstow, Calif.
1,383,058 Hose clamp. F. H. Atkin, San Francisco, Calif.
1,383,067 Pneumatic heel. E. Borman, Chicago, Ill.
1,383,070 Child's pedaling car with rubber tires. R. B. Bukolt, Stevens Point, Wis.
1,383,115 Inflatable geographical globe. E. Hendry, Fresno, Calif.
1,383,134 Hose clamp. C. J. Lundgren, Mount Jewett, assignor of ½ to H. J. Walter, Bradford—both in Pa.
1,383,155 Round rubber heel. L. J. Schaefer, Toledo, O.
1,383,190 Armored pneumatic tire. D. J. Demas, Pittsburgh, Pa.

GRANTED JULY 5, 1921

1,383,358 Demountable tire-rim. C. G. Westerberg, Monessen, Pa.
1,383,416 Double-flow fountain pen. Yuji Mukojima, Minowa, near Tokio, Japan.
1,383,458 Pneumatic tire. T. D. Frazier, Martin's Ferry, O.
1,383,502 Vaginal syringe. C. F. L. Vultee, Milwaukee, Wis.
1,383,583 Hose coupling. J. M. Towle, West Somerville, assignor of ½ to L. I. Beckwith, Boston—both in Mass.
1,383,591 Button, with metal shank. L. A. Angle, assignor to Art in Buttons, Inc.—both of Rochester, N. Y.
1,383,679 Demountable rim for tires. J. H. Wagenhorst, Jackson, Mich.
1,383,763 Resilient heel. W. E. Sanders, assignor to Essex Rubber Co., Inc.—both of Trenton, N. J.
1,383,767 Stopper for water bottles, etc. M. C. Schweinert, West Hoboken, N. J.
1,383,783 Rubber razor. R. E. Billingsley, San Antonio, Tex.
1,383,810 Demountable rim for tires. H. M. Howell, assignor by direct and mesne assignments, of 7½ per cent each to C. Schultze, R. Downs, J. E. Doughtie, S. C. Blackmon, and A. King, 15 per cent to L. H. Krickel, and 35 per cent to S. Kaplan—all of Monroe, La.
1,383,818 Cushion tire. D. W. Kirby, Gurdon, Ark.
1,383,962 Inner-tube container. J. H. Mills, Gallipolis, O.

GRANTED JULY 12, 1921

1,384,038 Drain plug. N. Becker, New York, N. Y.
1,384,094 Resilient inflatable pontoon. A. B. Saliger, assignor to Saliger Ship Salvage Corporation—both of New York, N. Y.
1,384,134 Sectional pneumatic tire. N. Jackson, Washington, D. C.
1,384,210 Sanitary douche. W. A. E. Pfaff, Kansas City, Mo.
1,384,243 Puncture-proof tire insert. R. B. Disbrow, St. Paul, Minn.
1,384,244 Inner tube relatively thicker at tread portion. R. B. Disbrow, St. Paul, Minn.
1,384,262 Tire tread. C. L. Landon, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.
1,384,274 Demountable rim for tires. O. A. Parker, Cleveland, O.
1,384,332 Hose coupling. B. J. Mullenux, Afton, N. Y.
1,384,399 Hydrometer syringe. E. Neerup, Chicago, Ill.
1,384,484 Reinforced pneumatic tire. H. E. Penwell, Turlock, Calif.
1,384,508 Resilient tire core. W. A. Black, Rocky Ford, Colo.
1,384,551 Reinforced tire. A. B. and H. A. Broluska, assignors of ½ to C. Cailliau—all of Detroit, Mich.
1,384,673 Swimming glove. S. J. Niemann, St. Paul, Minn.

THE DOMINION OF CANADA

GRANTED JUNE 7, 1921

168,097* Pneumatic tire. C. F. A. Gray, Montreal, Que.

* Withheld from publication during war with Germanic Powers.

GRANTED JUNE 28, 1921

212,272 Adjustable rubber sole pad. K. Kalen, Ottawa, Ont.

THE UNITED KINGDOM

PUBLISHED JULY 6, 1921

163,038 Reservoir-pen filler. T. Kovács, 108 Lindenstrasse, Berlin, Germany. (Not yet accepted.)
163,089 Cushion tire. W. Parker, 148 Burnley Road, Accrington, Lancashire.
163,102 Respirator and apparatus for detecting gases. L. A. Levy, 31 Shoot-up Hill, Cricklewood, and R. H. Davis, 187 Westminster Bridge Road—both in London.
163,126 Rubber and fabric band for reinforcing or repairing tire casings. A. E. Osborne and D. Robinson, 4 Lloyds Bank Chambers, Jamaica Row, Birmingham.
163,211 Motorcycle knee-grip. J. C. Burton and A. G. Barrett, Post Office Place, Leicester.
163,235 Garter. E. Landgraf, nee Cartharius, 44 Müller-Bersetstrasse, Dresden, Germany.
163,246 Rubber heel. O. Mussinan, 2 West 45th street, New York, New York, U. S. A.
163,285 Tire valve. A. Schrader's Son, Inc., 783 Atlantic avenue, Brooklyn, N. Y., assignee of H. P. Kraft, 219 Godwin avenue, Ridgewood, N. J.—both in U. S. A. (Not yet accepted.)

PUBLISHED JULY 13, 1921

163,434 Demountable rim for tires. T. J. Hobson, 17 Chain Walk, Aston, Birmingham.
163,502 Reservoir pen. C. Livsey, 11 Groveland Road, Wallasey, Cheshire.
163,503 Reservoir pen. W. T. K. Calton, 76 Newgate street, London.
163,542 Friction roller for contact with tire to drive motorscooter. M. Mehler and R. J. Nash, 132 Steelhouse Lane, Birmingham.
163,592 Inflatable safety belt for aviators. R. H. Davis, 187 Westminster Bridge Road, London.
163,638 Sectional pneumatic tire. W. J. Harper, Glenariff, Warren Drive, New Brighton, Cheshire.

PUBLISHED JULY 20, 1921

163,734 Pneumatic artificial foot with hard rubber tread and metal-protected toe and heel. G. Hardman, Belmont, Audenshaw Road, Audenshaw, Manchester.
163,890 Device for marking golf balls. J. H. Bromilow, 411 Gillott Road, Edgbaston, Birmingham.
163,895 Rubber-coated garment bags. A. Westwell, 88 Winwick street, Warrington.
164,013 Stopper for bottles, jars, etc. H. Quilitz, 12 Kulmbacherstrasse, Berlin, Germany. (Not yet accepted.)
164,099 Insert molded into edges of rubber soles to serve as hold for stitching. E. R. Pearce, Ajax Rubber Works, Leyland, Lancashire, and Wood-Milne, Limited, 2 Central Buildings, Westminster.

PUBLISHED JULY 27, 1921

164,152 Tire protector. F. and A. Crook, 27 Herbert street, Leyland, near Preston, Lancashire.
164,190 Parachute. E. R. Calthrop, Eldon Street House, Eldon street, London.
164,241 Reservoir pen. R. de Echevarria, Santa Cruz, Tagulaya, Davao, Philippine Islands.
164,321 Fabric and rubber endless track for vehicle wheels. A. Kegresse, 28 avenue de Tourville, Paris. (Not yet accepted.)
164,334 Electric coupling with hard rubber cap. Naamlooze Vennootschap Electriciteits Maatschappij Electrostoom, Postbox 301, Rotterdam, assignee of C. H. Jaspar, 8 Van der Poelstraat, same city. (Not yet accepted.)
164,369 Pneumatic tire. J. and C. Butazzi, 58 Pelayostreet, Barcelona, Spain.

NEW ZEALAND

PUBLISHED JUNE 2, 1921

43,036 Resilient tires. F. L. Rapson, Childwall Hall, Liverpool, Eng. (See THE INDIA RUBBER WORLD, December 1, 1919, page 156.)
45,445 Bicycle pedal with rubber inserts. Canada Cycle & Motor Co., Limited, Weston, York, assignee of H. W. Peace, 76 Pine Crest Road, Toronto—both in Ontario, Canada.

Chemical Patents will be found on pages 896-897. Machinery Patents on pages 905-907.

PUBLISHED JUNE 16, 1921

44,265 Stethoscope for engineers. R. B. Foord, Eltham, Taranaki.

PUBLISHED JUNE 30, 1921

45,628 Demountable rim for tires. A. J. Kohanski, 3065 Avers avenue, Chicago, Ill., U. S. A.

GERMANY

PATENTS ISSUED, WITH DATES OF ISSUE

340,006 (November 22, 1914) Pneumatic pressure tire with reserve tubes. Autobereifung "Ideal" Müller & Co., Berlin.

340,235 (October 5, 1919) Injection syringe. Albert Netzow, Vierländerstrasse 11, and Hans Fischer, Schultzweg 8—both in Hamburg.

340,345 (June 20, 1919) Exchangeable tread patch of rubber for heels of boots. Alois Droll, Krahnenstrasse 8, Köln-Mülheim.

TRADE MARKS

THE UNITED STATES

TWO KINDS OF TRADE MARKS NOW BEING REGISTERED

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

GRANTED JUNE 21, 1921, ACT OF FEBRUARY 20, 1905

NO. 143,941 SELWIN—leather shoes with leather, rubber, or composition soles and heels. Elliott Shoe Co., Brockton, Mass.

143,957 GOODRICH—rubber thread. The B. F. Goodrich Co., New York, N. Y.

143,959 AIR LOCK—valves for tires, pneumatic cushions, life preservers, etc. The Griffin Manufacturing Co., Boston, Mass.

144,048 MONARCH—elastic webbings. The Russell Manufacturing Co., Middletown, Conn.

ACT OF MARCH 19, 1920, SECTION 1 (b)

144,137 STERLING—slab zinc. The New Jersey Zinc Co., Newark and Franklin Borough, N. J.

144,140 O'SULLIVAN'S—rubber soles and heels. O'Sullivan Rubber Co., Inc., New York, N. Y.

144,153 Representation of seal bearing the words NEVER STICK around black disk in center—preparation to prevent tires from sticking to molds when curing. Western Vulcanizer Manufacturing Co., Chicago, Ill.

144,154 PEERLESS following W in white on black disk forming inner one of two concentric circles—belts, suspenders, and garters. The Wolfson Co., Chicago, Ill.

GRANTED JUNE 28, 1921, ACT OF FEBRUARY 20, 1905

144,157 BRITE MAWNIN—jar-rings. Amboy Products Co., Inc., Chicago, Ill.

144,171 DRIVE ON!—sheet rubber patches. Edward T. Barker, Oakland, Calif.

144,214 FAULTLESS—toy balloons. The Faultless Rubber Co., Ashland, O.

144,219 GOODRICH—druggists' and surgical sundries. The B. F. Goodrich Co., New York, N. Y.

144,235 EAGLE BRAND RUBBER TOYS—toy balloons. The Eagle Rubber Co., Ashland, O.

GRANTED JULY 5, 1921, ACT OF FEBRUARY 20, 1905

144,391 SHIP BY TRUCK—tires and tubes. Firestone Tire & Rubber Co., Akron, O.

144,401 GOODRICH—valves, belting, hose, packing, tires, washers, reliners and repair plugs. The B. F. Goodrich Co., New York, N. Y.

144,402 ANTHRACITE—rubber pump-valves. The B. F. Goodrich Co., New York, N. Y.

144,418 SYCAMORE and ILLINOIS WIRE on representation of rising sun—insulated wire and cable. Illinois Wire & Cable Co., Sycamore, Ill.

144,422 RED SPOT—brake linings and clutch facings. J. Russell Kelso. Trenton, N. J.

144,426 LAS-STIK—fabric and rubber repair patches. Las-Stik Patch Manufacturing Co., Hamilton, O.

144,456 A red-banded nipple—rubber nipples. Revere Rubber Co., Providence, R. I.

144,465 PANAMA GIRL and representation of head of girl wearing Panama hat—elastic webbings, garters, hose supporters, suspenders, ladies' dress belts, etc. The Russell Manufacturing Co., Middletown, Conn.

144,468 SEIBEL—pneumatic shock absorbers. Seibel Air-Spring Co., Inc., Phoenix, Ariz., and San Francisco, Calif. (See THE INDIA RUBBER WORLD, February 1, 1921, page 345.)

144,497 WILLARD THREAD RUBBER INSULATION—storage batteries and parts of hard rubber. Willard Storage Battery Co., Cleveland, O.

144,501 Wrigley Brownie-type figure seated on stick of chewing-gum—chewing gum. Wm. Wrigley Jr. Co., Chicago, Ill.

ACT OF MARCH 19, 1920, SECTION 1 (b)

144,521 CUPPLES—tires and tubes. Cupples Company Manufacturers, St. Louis, Mo.

144,525 AKRON RUBBER SHOE CO.—boots and shoes made wholly or partly of rubber. The B. F. Goodrich Co., New York, N. Y.

144,527 WURKSHU—rubber boots and shoes. Hood Rubber Co., Watertown, Mass. (See THE INDIA RUBBER WORLD, June 1, 1919, page 491.)

144,530 STERLING—zinc oxid. The New Jersey Zinc Co., Newark and Franklin Borough, N. J.

144,540 BEST-TEST—rubber hose and rubber and asbestos packing and brake-lining. Union Rubber & Asbestos Co., Trenton, N. J.

GRANTED JULY 12, 1921, ACT OF FEBRUARY 20, 1905

144,575 GOODRICH—battery jars made of hard or semi-hard rubber, or having rubber incorporated therein. The B. F. Goodrich Co., New York, N. Y.

144,578 SPIRALWEAVE—insulated wire and cables. Hazard Manufacturing Co., Wilkes-Barre, Pa. (See THE INDIA RUBBER WORLD, August 1, 1921, page 831.)

144,605 EAGLE BRAND and representation of eagle—insulated wire and cables. Marion Insulated Wire & Cable Co., Marion, Ind.

THE DOMINION OF CANADA

REGISTERED

28,453 INSURANCE—canvas and other hose for fluids. Canadian Consolidated Rubber Co., Limited, Montreal, Que.

28,540 FLEXYDE—belts for wear. The Marathon Tire & Rubber Co., Cuyahoga Falls, Ohio, U. S. A. (See THE INDIA RUBBER WORLD, June 1, 1921, page 673.)

28,541 MARATHON—belts for wear. The Marathon Tire & Rubber Co., Cuyahoga Falls, Ohio, U. S. A. (See THE INDIA RUBBER WORLD, June 1, 1921, page 673.)

28,551 Ornamental label bearing the words, "THE PLAYER'S DELIGHT," "A SIX TO ONE SHOT," above representation of head of race-horse within a circular opening—transparent rubber goods. The Transparent Rubber Goods Co., Limited, Toronto, Ont.

28,572 NATIONAL BRAND—suspenders, garters and armbands. The National Suspender Co., Limited, Toronto, Ont.

28,624 ECLIPSE—druggists' rubber sundries. J. G. Ingram & Son, Limited, The London India Rubber Works, Felstead street, Hackney Wick, London, England.

28,630 VICEROY—erasers, footwear, rubber clothing, heels and soles, vehicle covering, hose, tires, insulating material, cement, and druggists' sundries. The Canadian I. T. S. Rubber Co., Limited, Toronto, Ont.

28,656 Two concentric circles, the inner one being solid black with the words GREGORY RUBBER PRODUCTS showing in white thereon at a slight angle to the horizontal; the space between the inner and outer circles containing the words CANADIAN MADE at the top and the words FOR WORLD TRADE at the bottom. The Gregory Tire & Rubber Co., Limited, Vancouver, B. C.

28,664 SOLE followed by a large X; after that the letters TRA; all enclosed in a framework made by extending lines from the edges of the letter X—composition for treating rubber, leather and canvas goods. J. S. C. Adamson and J. R. Montpetit, Ottawa, Ont.

THE UNITED KINGDOM

PUBLISHED JULY 6, 1921

B409,996 EDINBURGH—pneumatic tires for cycles and motorcycles. The Dunlop Rubber Co., Limited, Dunlop House, 1 Albany street, Regent's Park, London, N. W. 1.

412,129 CONDENSITE—buttons, trays, knobs, wheels, handles, etc., manufactured from phenol-methylene compounds, included in Class No. 50. Condensite Company of America, 1 Grove street, Bloomfield, New Jersey, U. S. A. Address for service in the United Kingdom, care of White, Langner, Stevens & Parry, Jessel Chambers, 88-90 Chancery Lane, London, W. C. 2.

414,562 BELFRY—hose included in Class No. 50. Raven Hose & Belting Co., Limited, 295 Liverpool street, Salford, Manchester, Lancashire.

414,563 IVANHOE—hose included in Class No. 50. Raven Hose & Belting Co., Limited, 295 Liverpool street, Salford, Manchester, Lancashire.

414,564 SPORRAN—hose included in Class No. 50. Raven Hose & Belting Co., Limited, 295 Liverpool street, Salford, Manchester, Lancashire.

PUBLISHED JULY 13, 1921

403,662 AVON—rubber footwear sundries not included in classes other than No. 40. The Avon India-Rubber Co., Limited, Rubber Works, Bath Road, Melksham, Wiltshire, and 343-5 Euston Road, London, N. W. 1. (Advertised before acceptance. alleging distinctiveness.)

403,663 AVON—golf balls. The Avon India-Rubber Co., Limited, Rubber Works, Bath Road, Melksham, Wiltshire, and 343-5 Euston Road, London, N. W. 1. (Advertised before acceptance, alleging distinctiveness.)

414,768 BRINDIA—tires for all kinds of motor vehicles. The Hercules Cycle & Motor Co., Limited, Britannia Works, 145 Conybere street, Birmingham.

415,133 Representation of profile of Indian maiden's head, with word INCA on band around head-dress, silhouetted against circular black disk—rubber pads for boots and shoes. Blakey's Boot Protectors, Limited, Armley Malleable Ironworks, Modder Place, Armley, Leeds.

415,134 Representation of profile of Indian chief, with word INCA on band around head-dress, silhouetted against circular black disk—rubber pads for boots and shoes. Blakey's Boot Pro-Protectors, Limited, Armley Malleable Ironworks, Modder Armley, Leeds.

415,517 CHARMER—rubber tobacco pouches. The Civic Co., Limited, 81 Fulham Palace Road, Hammersmith, London, W. 6.

PUBLISHED JULY 20, 1921

B406,440 FARREL—rubber machinery, etc. Farrel Foundry & Machine Co., 25 Main street, Ansonia, Conn., U. S. A. Address for service in the United Kingdom, care of White, Langner, Stevens & Parry, 88-90 Chancery Lane, London, W. C. 2.

B408,239 FLEXO—garters, hose supporters and arm bands included in class No. 38. A. Stein & Co., 1149 West Congress street, Chicago, Ill., U. S. A. Address for service in the United Kingdom, care of Marks & Clerk, 57-8 Lincoln's Inn Fields, London, W. C. 2.

411,483 RAYNETITE below representation of a club spot and the words CLUB BRAND "A 1"—raincoats, etc. J. T. Newall, Oak House, Cross street, Ashton-on-Mersey, Cheshire.

412,613 QUIES—ear silencers to lessen vibration. M. H. Lepaute, 17-23 rue Desounettes, Paris, France. Address for service in the United Kingdom, care of Abel & Imray, 30 Southampton Buildings, London, W. C. 2.

B412,799 FIREFOAM—fire-extinguishing apparatus for volatile inflammables. Foamite Firefoam, Limited, 65 South Molton street, London, W. 1.

B412,801 FIREFOAM—fire-extinguishing compounds for volatile inflammables. Foamite Firefoam, Limited, 65 South Molton street, London, W. 1.

413,665 HALO-FRICTION disks, etc., of impregnated fibrous material. Scandinavia Belting, Limited, 59 Southwark street, London, S. E. 1.

PUBLISHED JULY 27, 1921

414,704 PENDRIL—fountain and stylographic pens. J. R. Brough, "Eversly," Shepherd's Hill, Highgate, London, N. 6.

415,001 MAILLATYPE—rubber erasers, fountain pens, etc. E. J. Revilière, trading as Etablissements Mallat, 80 Finsbury Pavement, London, E. C. 2, and 53 boulevard de Strasbourg, Paris, France.

NEW ZEALAND

17,497 Representation of label bearing the words WRIGLEY'S JUICY FRUIT CHEWING GUM in two panels and the signature WM. WRIGLEY JR. CO. in one, accompanied by the words CHICAGO, NEW YORK, TORONTO, LONDON—chewing gum. Wm. Wrigley Jr. Co., 5 North Wabash avenue, Chicago, Ill., U. S. A.

17,571 FLINTOS in panel with conventionalized outline—footwear of fabric and rubber. Canadian Consolidated Rubber Co., Limited, 201 Inspector street, Montreal, Quebec, Canada.

17,577 Representation of seal bearing words RHODE ISLAND RUBBER CO., U. S. A.—rubber footwear, particularly overshoes. Woonsocket Rubber Co., Woonsocket, Rhode Island, U. S. A.

17,578 WOONSOCKET—rubber footwear, particularly overshoes. Woonsocket Rubber Co., Woonsocket, Rhode Island, U. S. A.

17,936 PUSSY-FOOT—rubbers, rubber footwear, etc. The Hurlbut Co., Limited, Preston, Ontario, Canada.

17,979 DAINITE—rubber and gutta percha goods not included in classes other than No. 40. W. E. and O. W. H. Briggs, trading as Harborough Rubber Co., Rubber Mills, St. Mary's Road, Market Harborough, England.

18,027 AGRIPPA—druggists' rubber sundries. J. G. Ingram & Son, Limited, The London Indiarubber Works, Felstead street, Hackney Wick, London, England.

DESIGNS

THE UNITED STATES

NO. 58,178 Tire casing. Patented June 21, 1921. Term 14 years. E. L. Campbell, assignor to The J. R. Watkins Co.—both of Winona, Minn.

58,180 Fneumatic tire. Patented June 21, 1921. Term 14 years. W. F. Collins, assignor of ½ to J. J. Schweinefuss—both of Centerville, Ia.

58,181 Tire casing. Patented June 21, 1921. Term 14 years. F. S. Dickinson, New York, N. Y., assignor to The Perfection Tire & Rubber Co., a Delaware corporation.

58,182 Tire casing. Patented June 21, 1921. Term 14 years. F. S. Dickinson, New York, N. Y.

58,187 Tire. Patented June 21, 1921. Term 14 years. I. V. Humphrey, Highland Park, Pa.

58,191 Non-skid tire tread. Patented June 21, 1921. Term 14 years. C. B. Klopfenstine, assignor to Iowa Cord Tire Co.—both of Des Moines, Ia.

58,192 Non-skid tire tread. Patented June 21, 1921. Term 14 years. C. B. Klopfenstine, assignor to Iowa Cord Tire Co.—both of Des Moines, Ia.

58,198 Tire. Patented June 21, 1921. Term 7 years. H. Raflovich, Buffalo, N. Y.

58,218 Tire Patented June 28, 1921. Term 14 years. G. K. Culp, New York, N. Y., assignor to New England Tire & Rubber Co., Holyoke, Mass.

58,243 Tire tread. Patented June 28, 1921. Term 14 years. G. Lambright, Fond du Lac, Wis.

58,316 Combined garter and powder-puff receptacle. Patented July 12, 1921. Term 7 years. A. Heald, Washington, D. C.

THE DOMINION OF CANADA

5,075 Tire tread. Patented June 22, 1921. H. T. Pyke, Toronto, Ont.
5,076 Tire tread. Patented June 22, 1921. R. S. Smart, Ottawa, Ont.
5,077 Tire tread. Patented June 22, 1921. R. S. Smart, Ottawa, Ont.
5,078 Tire tread. Patented June 22, 1921. R. S. Smart, Ottawa, Ont.
5,079 Inside blow-out shoe for tires. Patented June 22, 1921. Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ont.

GERMANY

DESIGN PATENTS, WITH DATES OF ISSUE

778,092 (April 2, 1921) Valve for inner tubes. Lammerspieler Metallwaren und Schraubenfabrik Melber & Co., Lämmerspiel, near Offenbach-on-the-Main.

781,037 (April 9, 1921) Rubber heel protector. August Glöckner, Peter strasse 6, Worms.

781,231 (May 23, 1921) Solid rubber heel with edges of leather or similar material. Carl Grebe, Carnapstrasse 74, Elberfeld.

781,864 (May 24, 1921) Arrangement of treads for covers of pneumatics for bicycles, motorcycles and automobiles. The Dunlop Rubber Co., Limited, London; represented by Dr. R. Wirth, C. Weihe, Dr. H. Weil, M. M. Wirth, Frankfurt-on-the-Main, and T. R. Koehnhorn, Berlin, S. W. 11.

781,985 (April 29, 1921). Protective Cap for rubber nipples. Franz Plödt, Hersbruck.

782,175 (May 28, 1921) Rubber nipple for milk bottles. Willy Bach, Schedewitz, near Zwickau.

782,228 (May 25, 1921) Linen band on rubber collar. Heinrich Wolf, Gelsenkirchen-Bismark.

782,397 (May 18, 1921) Tread for tires, solid rubber tires and felloe tires. Friedrich Rutge, Haaren, near Aachen.

782,827 (June 4, 1921) Water pipe cock with rubber ball closing. Rudolf Schmid, Carl Fritz and Hermann Schmidd—all of Balingen, Württenberg.

782,865 (May 17, 1921) Rubber sole. Westdeutsche Gummi Co. H. Chormann, Düsseldorf.

782,958 (June 6, 1921) Pen holder with rubber end. Hermann Poser, Siegen i. W.

783,031 (May 30, 1921) Rubber tire having a tread on which semicircular ridges are arranged to form a lattice design. Vereinigte Gummiwarenfabriken Harburg-Wien, formerly Menier-J. N. Reithoffer, Harburg a. E.

783,033 (May 31, 1921) Metal disk for attaching rubber soles. Rheinische Gummi-Gesellschaft W. Klotz & Co., Düsseldorf.

783,041 (June 3, 1921) Metal insert under tread to protect tubes of bicycles, etc. Arno Paul, Thalstrasse 13, Gera, Reuss.

783,307 (December 18, 1920) Football. Alfred Paetzold, Wassertorstrasse 32, Berlin.

783,318 (April 13, 1921) Return valve for pneumatic tires. Neumann & Pfeiffer, Osnabrück.

783,321 (April 20, 1921) Tire. Gummiwerk Martell G. m. b. H., Halle-on-the-Saale.

783,428 (June 6, 1921) Rubber heel. Julius Löwenstein, Savignystrasse 33, and Robert Baldenweck, Leerbachstrasse 50—both in Frankfurt-on-the-Main.

783,536 (June 14, 1921) Rubber heel. Bernhard Bossmann, Benderstrasse 158, Düsseldorf-Gerresheim.

783,707 (September 23, 1920) Tire valve. Gustav Treutler, Dittersbach, near Waldenburg, Silesia.

783,714 (March 5, 1921) Elastic tire for motor vehicles. Neumann & Pfeiffer, Osnabrück.

783,866 (June 18, 1921) Injector syringe. Max Fleischer, Kirchstrasse 1 B., Charlottenburg.

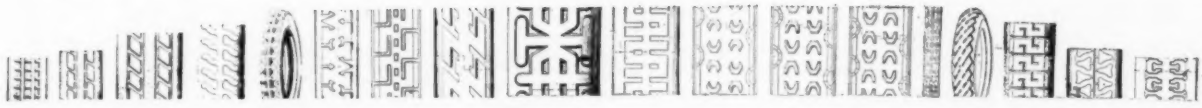
784,256 (June 11, 1921) Rubber layer for tread of footwear with opening for the passage of a piece of material. Otto Stöhr, Quasnitz, Post Lützschena.

784,311 (June 14, 1921) Vulcanized rubber handle, in two parts, for bicycles. Gummiwarenfabrik P. Pens, Berlin.

NEW JAPANESE TRADE-MARK LAW

According to the new trade-mark law of Japan, dated April 9, 1921, the registration fee is 30 yen, which covers a period of 20 years, with a renewal fee of 50 yen. One yen equals $0.4985. A collective trade-mark may be registered by an organization of persons in the same business, or by business men intimately connected with the object of promoting the common business interests of the members of the organization. The registration fee for a collective trade-mark is 100 yen, with a renewal fee of 150 yen.

A trade-mark is canceled when not used in the Empire for a year after registration, or when its use has been suspended for a period of 3 consecutive years. The trade-mark right in a trade-mark which has been registered as a foreign trade-mark is terminated when the trade-mark right in the home country is terminated.



58,187 58,181 58,182 58,192 58,180 58,178 58,419 58,243 58,500 58,494 58,463 58,464 58,465 58,478 58,218 58,491 58,198 58,191

58,419 Tire. Patented July 19, 1921. Term 14 years. J. M. Alderfer, Akron, O.

58,463 Non-skid tire tread. Patented July 26, 1921. Term 14 years. E. N. Downes, assignor to McClaren Rubber Co.—both of Charlotte, N. C.

58,464 Non-skid tire tread. Patented July 26, 1921. Term 14 years. E. N. Downs, assignor to McClaren Rubber Co.—both of Charlotte, N. C.

58,465 Non-skid tire tread. Patented July 26, 1921. Term 14 years. E. N. Downes, assignor to McClaren Rubber Co.—both of Charlotte, N. C.

58,478 Tire tread. Patented July 26, 1921. Term 14 years. W. S. Gauntt, Kansas City, Mo.

58,491 Tire tread. Patented July 26, 1921. Term 7 years. E. F. Kling, assignor to The Batavia Rubber Co.—both of Batavia, N. Y.

58,494 Tire. Patented July 26, 1921. Term 7 years. E. L. Lawlor, Youngstown, O.

58,500 Tire. Patented July 26, 1921. Term 14 years. C. S. Park, assignor to Corona Cord Tire Co.—both of East Butler, Pa.

Review of the Crude Rubber Market

NEW YORK

GENERALLY speaking, the plantation rubber market has been fairly steady during the past month, and, although a firm undertone has prevailed throughout the period in review, prices have shown minor declines since the first of August.

There was considerable factory buying early in the month, giving strength to the market situation that was further supported by the firmness with which dealers held to their prices. As there was very little distressed rubber in sight at this time, factory offers of 13 to 13½ cents for spot ribs and 15 to 15½ cents for first latex were ignored. Large buying orders placed in the Far East and attributed to local dealers indicated an actual demand that stiffened the eastern market on all grades.

Following a fairly active demand featured by factory buying and dealers' business, the market sagged under selling pressure, and spot ribs sold around 13¾ to 14 cents with latex at 15 to 15¼. For some time crêpe has been at a premium over ribs, but quite recently values have tended toward similar price levels. This is due to more crêpe and less ribs being made in the primary markets, as the quantity of moldy ribs that have been arriving for some time has had a depressing effect on this market.

Toward the close of the month, market conditions became dull and there was very little trading, although factory interest in the way of inquiries was evident. Buyers and sellers could agree only when the former were forced into the market for needed supplies, and at the sellers' prices of 14½ cents for latex and 13½ cents for ribs.

Brazilian Parás gained several points early in the month, due to the rise in Brazilian exchange, and upriver fine rose to 19½ cents, but lacking interest it later fell to 17½ cents.

Imports of all grades during July were 11,692 tons, compared with 15,884 tons last year. Plantation arrivals for July were 11,140 tons, compared with 14,695 tons a year ago. Total imports of all grades for the seven months ended July 31, 1921, were 90,404 tons, compared with 167,773 tons for the corresponding period in 1920.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATIONS. August 1. Spot, first latex crêpe, 15 to 15½ cents; August—September, 15½ cents; October—December, 15½ cents. August 23. Spot, first latex crêpe, 14½ cents; October—December, 15¾ cents; January—March, 16¼ cents; January—June, 17¼ cents.

August 1. Spot, ribbed smoked sheets, 13¾ cents; August—September, 14 cents; October—December, 14½ cents. August 23. Spot, ribbed smoked sheets, 13½ cents; October—December, 14¼ cents; January—March, 15¼ cents; January—June, 16½ cents.

August 1. Spot, No. 1 amber crêpe, 13 cents; August—September, 13¼ cents; October—December, 13½ cents. August 23. Spot, No. 1 amber crêpe, 13 cents; October—December, 13½ cents; January—March, 14½ cents; January—June, 16½ cents.

August 1. Spot, No. 1 rolled brown crêpe, 11 cents; August—September, 11 cents. August 23. Spot, No. 1 rolled brown crêpe, 10½ cents; October—December, 11 cents; January—March, 12 cents.

SOUTH AMERICAN PARÁS AND CAUCHO. August 1. Spot, upriver fine, 17 cents; islands fine, 17 cents; upriver coarse, 8¾ cents; islands coarse, 7 cents; Cametá, 8¼ cents; caucho ball, 9½ cents. August 23. Spot, upriver fine, 17½ cents; islands fine, 17½ cents; upriver coarse, 9¼ cents; islands coarse, 7 cents; Cametá, 8 cents; caucho ball, 10 cents.

NEW YORK QUOTATIONS

Following are the New York spot quotations, for one year ago, one month ago, and August 25, the current date:

	September 1, 1920	August 2, 1921	August 25, 1921
PLANTATION HEVEA			
First, latex crêpe	$0.31 @	$0.15½ @	$0.14¼ @
Off latex crêpe	@	.15 @	.13½ @
Amber crêpe No. 1	.29 @	.13¾ @	.12½ @
Amber crêpe No. 2	.28 @	.12¾ @	.11½ @
Amber crêpe No. 3	.27 @	.11¾ @	.10½ @
Brown crêpe, thick and thin	.26 @	.12½ @ .13	.11 @
Brown crêpe, specky	.25 @	.11½ @	.10½ @
Brown crêpe, rolled	.24½ @	.11¼ @	.10½ @
Smoked sheet, ribbed	.30 @ .30½	.14½ @	.13¾ @
Smoked sheet, plain	.29 @	.12 @	.11½ @
Unsmoked sheet	.26 @	@	@
Colombo scrap No. 1	.22 @	@	@
Colombo scrap No. 2	.21½ @	@	@
EAST INDIAN			
Assam crêpe	@	@	@
Assam onions	@	@	@
Penang block scrap	@	@	@
PONTIANAK			
Banjermassin	.09¼ @ .11½	.06½ @ .07	.07½ @
Palembang	.10¼ @	.07¾ @	.07½ @
Pressed block	.19 @	.09 @ .10	.10 @ .11
Sarawak	.08¾ @	.06¼ @	.06¾ @
SOUTH AMERICAN			
PARAS			
Upriver, fine	.30 @	.17 @ .17½	.17¼ @
Upriver, medium	.29 @ .30	.15½ @	.14¼ @
Upriver, coarse	.21½ @ .22	.08½ @	.09¼ @
Upriver, weak, fine	.27 @	.14 @	.13½ @
Islands, fine	.28 @	.16½ @	.17 @
Islands, medium	*.26 @ .28	.13½ @	.14 @
Islands, coarse	.19 @	.08 @ .08½	.07 @
Cametá	.17 @	.08¼ @	.08 @
Acre Bolivian, fine	.33½ @ .34	.17 @	.17½ @
Madeira, fine	.35 @	.18½ @	.22 @
Beni Bolivian	@	@	.17¾ @
Peruvian, fine	.31 @	.15½ @	.17½ @
Tapajos, fine	.30 @ .31	.15 @	.17 @
CAUCHO			
Upper caucho ball	.21½ @ .22	.10 @	.10 @
Lower caucho ball	.18½ @	.08¼ @	.07½ @
MANICOBAS			
Ceará negro heads	.23 @	.10 @	*.10 @
Ceará scrap	.20 @	.07½ @	*.08 @
Maniçoba, 30% guaranty	.25 @	.09 @	*.10 @
Mangabeira thin sheet	.28 @	.10 @	*.12 @
CENTRALS			
Corinto scrap	.18 @	.10 @ .11	.08 @ .11
Central scrap	.18 @	.10 @ .11	.08 @ .11
Central scrap and strip	.15 @	.08 @ .10	.07 @ .09
Central wet sheet	.13 @	.02 @ .04	.05 @
Esmeralda sausage	.18 @	.10 @ .11	.08 @ .11
Guayule, 20% guaranty	.27 @	@	@
Guayule, washed and dried	.37 @	.25 @	.25 @
AFRICANS			
Benguela, No. 1. 28½%.	@	.04 @ .05	@
Benguela, No. 2, 32½%.	@	.06 @	.05 @
Conakry niggers	@	@	@
Congo prime, black upper	@	@	@
Congo prime, red upper	@	@	@
Kassai, black	@	@	@
red	@	@	@
Massai sheets and strings	@	@	@
Niger flake, prime	@	.11 @ .13	@
Rio Nunez ball	@	@	@
Rio Nunez sheets, strings	@	@	@
GUTTA PERCHA			
Gutta Siak	.20½ @ .22½	.14 @ .15	.15 @
Red Macassar	2.00 @ 2.95	2.50 @ 3.00	2.50 @
BALATA			
Block, Ciudad, Bolivar	.67 @ .68	.53 @ .54	.53 @
Colombia	.47 @	.39 @ .40	.39 @
Panama	.40 @	.39 @ .40	.25 @
Surinam sheet	.75 @	.67 @ .68	.64 @ .65
amber	.82 @	.70 @	.68 @ .69

*Nominal.

RECLAIMED RUBBER

Conditions in the market for reclaimed rubber remain essentially the same as last month. The tendency to improvement in demand increases with the approach of normal output in automobile tire and other rubber manufacturing lines. Reclaimers, however, continue to operate their plants at about 25 per cent of capacity.

The immense over-stock of crude rubber at record low prices has effectually blocked demand for reclaimed except along certain lines where it offers special technical advantages.

Quotations remain nominal and unchanged from last month.

NEW YORK QUOTATIONS

August 25, 1921

Prices subject to change without notice.

STANDARD RECLAIMS			
Floating	$0.14	@	$0.16
Friction	.14	@	.16
Mechanical	.09	@	.11
Shoe	.11¼	@	.12¼
Tires, auto	.11¼	@	.13¼
truck	.09	@	.11
White	.14	@	.15

COMPARATIVE LOW AND HIGH NEW YORK SPOT RUBBER PRICES

	August 1921*	August 1920	August 1919
PLANTATIONS			
First latex crêpe	$0.14¼ @ $0.17	$0.29¼ @ $0.33½	$0.41¾ @ $0.45½
Smoked sheet ribbed	.13½ @ .15	.29½ @ .33¾	.39¾ @ .44½
PARAS			
Upriver, fine	.17 @ .19½	.30 @ .35	.54 @ .55
Upriver, coarse	.08¾ @ .11½	.20 @ .27	.31½ @ .32
Islands, fine	.16½ @ .18½	.29 @ .32	.47½ @ .47½
Islands, coarse	.07 @ .08	.19 @ .20	.21½ @ .21½
Cametá	.07½ @ .09	.18 @ .18	.21½ @ .21½

*Figured to August 25, 1921.

ANTWERP RUBBER MARKET

OSTERRIETH & CO., Antwerp, report under date of August 6, 1921.

Our market seems to have recovered from the state of pessimism prevailing at the time of our last report, and although the activity still leaves much to be desired there is a steadier undertone and a bit of inquiry, too, on the part of consumers who generally consider the actual level of prices interesting and seem to be in possession of some more orders for manufactured goods. We close the week as follows:

	Crêpes, Francs per Kilo	Sheets, Francs per Kilo
August, 1921	4.25	4.00
September	4.50	4.00
October	4.65	4.15
November	4.75	4.25
December	4.80	4.25
January, 1922	5.00	4.35
February	5.00	4.35
March	5.00	4.45
April	5.00	4.45
May	5.00	4.45
June	5.00	4.45
July	...	...

In Congo rubber there has not been much business passing, although there are buyers in the market, whose idea of prices, however, is rather out of the question. We quote today:

	Francs per Kilo
Prime Red Kasai	3.40
Kasai Loanda II	1.60/2.50
Red thimbles	0.75

Usual Antwerp terms.

AMSTERDAM RUBBER MARKET

JOOSTEN & JANSSEN, Amsterdam, report, under date of August 5, 1921: There was a good demand this week, though little offering, and prices going up gradually. In the beginning October-December crêpe was quoted at 47-48 cents; later on this position has been sold at 53-54. August-September and January-March were going up as well. The market closed this afternoon on the following prices:

Hevea crêpe, Fl. .50	Sheets, Fl. .48 spot.
Hevea crêpe, Fl. .54	Sheets, Fl. .51 October—December.
Hevea crêpe, Fl. .57	Sheets, Fl. .54 January—March.

There was almost no business in spot; while the future market had a good turnover.

HAMBURG RUBBER MARKET

Effektiv-Rohgummimakler-Verein, Hamburg, reports, under date of July 23, 1921:

While the market was very firm and business was brisk up to the middle of the week, a certain weakening in standard qualities was noticeable toward the end of the week. The demand for medium qualities like brown crêpe and inferior smoked sheets, as well as Pará grades, particularly caucho ball, remained active with higher prices.

During the week selling was active in all grades and large quantities of medium qualities were sold.

	Marks
First latex crêpe	24 @ 25
Ribbed smoked sheets	22 @ 23
Ribbed smoked sheets, lower grade	18.50 @ 20.50
Brown crêpe, clean	17 @ 19
Brown crêpe, somewhat barky	15.50 @ 17
Dark crêpe	15 @ 16
Hard fine Pará	27.50 @ 28.50
Caucho ball	17 @ 18
Panama and Colombia black balata	.55 @ .75
No. 1 balata sheet	100 @ 110
Jelutong	10 @ 12

SINGAPORE RUBBER MARKET

GUTHRIE & CO., Limited, Singapore, report under date of July 7, 1921:

The firmer tendency evidenced in the local rubber market a week ago matured to an active market, due chiefly to dealers covering, and a general rise in values of 2½ cents resulted. The weekly auctions held yesterday opened quietly, but improved later on, additional buyers coming in. At the afternoon session competition was keen and the sale closed strongly at best. No standard quality sheet and crêpe was sold. Good F. A. Q. sheet was in strong demand up to 22½ cents (1 lot sold for 23 cents) and off quality lots fetched relatively good prices. Off quality crêpe sold up to 26 cents (26¼ cents was paid for one lot), an advance of 2½ cents on the week. Fine browns were in short supply and advanced 2½ cents. Good brown and dark crêpes remained steady. A small quantity of bark crêpe sold from 5 to 8½ cents. Of 681 tons catalogd, 469 tons were offered and 390 tons sold. The following is the course of values :

	In Singapore per pound		Sterling Equivalent per pound in London		
Sheet, good ribbed smoked	15	@ 23	—/ 6¼	@ —/ 8½
Crêpe, good pale	16	@ 26½	—/ 7	@ —/10
Crêpe, fine brown	13	@ 18½	—/ 6⅛	@ —/ 7¾
Crêpe, good brown	8½	@ 12½	—/ 4⅛	@ —/ 6
Crêpe, dark	8	@ 11	—/ 4¼	@ —/ 5⅝
Crêpe, bark	5	@ 8½	—/ 3¼	@ —/ 4⅛

PLANTATION RUBBER EXPORTS FROM MALAYA

(These figures include the production of the Federated Malay States, but not of Ceylon)

	January 1 to May 31, 1921			January 1 to July 7, 1921	
	Singapore	Malacca	Penang	Port Swettenham	Totals
To United Kingdom ....*pounds*	25,947,473	2,299,953	9,482,699	9,984,792	47,714,917
The Continent	4,724,272	1,739,485	101,600	59,132	6,624,489
Japan	17,487,668	.....	.....	37,575	17,525,243
Ceylon	44,627	.....	113,999	243,884	402,510
United States and Canada	42,110,628	15,640	930,733	.....	43,057,001
Australia	509,294	806	.....	.....	510,100
Other countries	.....	.....	796,533	.....	796,533
Totals..*pounds*	90,823,962	4,055,884	11,425,564	10,325,383	116,630,793

Compiled by Barlow & Co., Singapore.

NEW YORK AVERAGE SPOT RUBBER PRICES

Prices in Cents Per Pound

	JULY, 1921												AUGUST, 1921											
	18	19	20	21	22	23	25	26	27	28	29	30	1	2	3	4	5	6	8	9	10	11	12	13
PLANTATIONS																								
Sheet																								
Ribbed smoked	15¼	15¼	15	14⅜	14½	14½	14⅜	14¼	14⅜	13⅜	13¾	13¾	13¾	14	14⅜	14¾	14¾	14¾	14¾	14¾	14¾	14⅜	13¾	14
Crêpe																								
First latex	16½	17½	16¾	16¼	16¼	16¼	15¼	15¼	15⅜	14¾	14¾	14¾	15⅛	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	14⅞	14¾	14½
Off latex	14	16⅞	14¼	14⅝	14¾	14¾	14¼	13⅝	14	13¾	13½	13½	13¾	13¾	13¾	13¾	13¾	13¾	14¼	14¼	14¼	14	14¼	14¼
No. 1 blanket	13¾	13⅝	13⅜	13¾	13¼	13¼	13¾	13⅝	13¼	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	13	13¼	13¼	12¾	12¾	12¾
No. 2 blanket	12¾	12⅞	12½	12¾	12¼	12¼	12¾	12½	12½	12⅛	11¾	11¾	11¾	11¾	11¾	11¾	11¾	11¾	12¼	12¼	12¼	11¾	11¾	11¾
No. 3 blanket	11¾	12⅛	11½	11¾	11¾	11¾	11¾	11½	11¾	11¼	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	11¾	11½	11¼	10¾	10¾	10¾
Thin, clean, brown	13	13¼	12½	12¾	12¾	12¾	12¾	12¾	12¼	11¾	11¾	11¾	11½	11½	11½	11½	11½	11½	11¾	12⅛	12	11½	11¾	11¾
Specky brown	11½	12	11¼	11¾	11⅝	11⅝	11½	11¼	11	10¾	10¾	10¾	10½	10¾	10¾	10¾	10¾	10¾	10¾	11¼	11	11	10¾	10¾
Rolled brown	11	11⅛	11¼	11¼	11¼	11¼	10¾	11¼	10½	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	11	11	11	11	11	11

FEDERATED MALAY STATES RUBBER EXPORTS

An official report from Kuala Lumpur states that the exports of plantation rubber from the Federated Malay States in June amounted to 5,823 tons, which compares with 7,658 tons in May and 9,049 tons in the corresponding month last year. Exports for the first half of the present year amounted to 41,509 tons as against 55,475 tons last year and 50,717 tons in 1919. Appended are the comparative statistics:

	1919	1920	1921
January ..... *tons*	7,163	11,119	7,085
February	10,809	9,781	6,091
March	10,679	9,524	7,408
April	7,664	8,375	7,444
May	7,308	7,627	7,658
June	7,094	9,049	5,823
Totals ..... *tons*	50,717	55,475	41,509

STRAITS SETTLEMENTS RUBBER EXPORTS

An official report from Singapore states that 10,111 tons of rubber (transhipments, 1,810 tons) were exported from Straits Settlements ports in the month of June as compared with 8,813 tons in May and 11,663 tons in the corresponding month last year. The half year's exports amounted to 43,912 tons as against 73,483 tons last year, and 82,725 tons in 1919. Appended are the comparative statistics:

	1919	1920	1921
January ..... *tons*	14,404	13,125	5,809
February	15,661	17,379	5,813
March	20,908	5,931	7,275
April	10,848	9,768	6,091
May	15,845	15,617	8,813
June	5,059	11,663	10,111
Totals ..... *tons*	82,725	73,483	43,912

CEYLON RUBBER EXPORTS

	January 1, to June 30	
	1920	1921
To United Kingdom ..... *pounds*	17,869,744	16,384,417
Austria	.....	980
Belgium	106,830	249,904
France	440,817	317,900
Germany	108,228	1,823,488
Holland	28	374,281
Denmark	.....	51,565
Italy	89,600	95,200
Norway	.....	2,240
Western Australia	56	.....
Victoria	89,669	125,890
New South Wales	180,094	103,800
United States	22,078,498	22,317,223
Canada and Newfoundland	425,600	419,148
India	586	8,382
Straits Settlements	44,800	.....
Japan	157,667	207,376
Totals ..... *pounds*	41,592,217	42,481,794

Compiled by the Ceylon Chamber of Commerce.

PLANTATION RUBBER EXPORTS FROM JAVA*

	May		Five Months Ended May	
	1920	1921	1920	1921
To Netherlands ..... *kilos*	317,000	876,000	1,846,000	3,728,000
Great Britain	407,000	213,000	2,731,000	4,065,000
Germany				145,000
France	31,000*	3,000	49,000*	.....
Belgium				5,000
Italy				4,000
United States	1,362,000	117,000	7,041,000	2,508,000
Singapore	176,000	11,000	1,865,000	1,058,000
Japan	6,000	.....	184,000	95,000
Australia	30,000	834,000	46,000	1,043,000
Totals ..... *kilos*	2,329,000	2,054,000	13,762,000	12,651,000
Ports of origin:				
Tandjong Priok ..... *kilos*	1,274,000	1,940,000	6,645,000	6,786,000
Samarang	8,000	29,000	193,000	160,000
Soerabaya	1,045,000	28,000	6,517,000	4,802,000

*Destinations not separately mentioned.

CRUDE RUBBER ARRIVALS AT ATLANTIC AND PACIFIC PORTS AS STATED BY SHIPS' MANIFESTS

PARAS AND CAUCHO AT NEW YORK

	Fine	Medium	Coarse	Caucho	Totals Pounds
JULY 24. By the S. S. "Dunstan" from Pará.					
Schafer & Meyer	57,396	4,488	23,760	.....	85,644
Paul Bertuch	.....	.....	22,982	.....	22,982
Meyer & Brown, Inc.	48,775	.....	.....	.....	48,775†
Poel & Kelly, Inc.	112,000	4,480	4,480	30,000	150,960
JULY 24. By the S. S. "Dunstan" from Manáos.					
Paul Bertuch	56,484	.....	.....	.....	56,484
AUGUST 10. By the S. S. "Justin" from Manáos.					
Fred Stern & Co.	1,120	.....	4,480	.....	5,600
AUGUST 10. By the S. S. "Justin" from Pará.					
Poel & Kelly, Inc.	70,000	.....	6,720	56,000	132,720
AUGUST 12. By the S. S. "Sallust" from Pará.					
H. A. Astlett & Co.	40,000	15,000	.....	.....	55,000
Poel & Kelly, Inc.	22,400	.....	.....	22,400	44,800
AUGUST 12. By the S. S. "Sallust" from Manáos.					
Paul Bertuch	28,924	.....	.....	58,532	87,456
Fred Stern & Co.	44,800	.....	22,400	.....	67,200
AUGUST 17. By the S. S. "Balzac" from Pará.					
Poel & Kelly, Inc.	36,000	.....	.....	117,000	153,000

†Includes medium.

PLANTATIONS

(Figured at 180 pounds net to the bale or case.)

	Shipment from:	Shipped to:	Pounds.	Totals.
JULY 20. By the S. S. "City of Chester" at New York.				
Konig Brcs. & Co.	Colombo	New York	20,340	
Meyer & Brown, Inc.	Colombo	New York	145,600	
Baring Bros.	Colombo	New York	20,160	
Charles T. Wilson Co., Inc.	Colombo	New York	80,640	
General Rubber Co.	Colombo	New York	151,200	
Smith & Schippers, Inc.	Colombo	New York	175,860	
Poel & Kelly, Inc.	Colombo	New York	44,100	
Fred Stern & Co.	Colombo	New York	22,400	
H. A. Astlett & Co.	Colombo	New York	22,000	
Various	Colombo	New York	475,540	1,157,840
JULY 21. By the S. S. "Lancaster" at New York.				
Netherlands Corporation for Oversea Trade	Soerabaya	New York	215,640	
L. Littlejohn & Co., Inc.	Soerabaya	New York	173,880	
J. D. Lewis.	Soerabaya	New York	24,840	
Various	Soerabaya	New York	49,680	
J. T. Johnstone & Co., Inc.	Malacca	New York	90,000	
Firestone Tire & Rubber Co.	Malacca	Akron	205,740	
Manhattan Rubber Manufacturing Co.	Batavia	New York	18,720	
Mitsui & Co., Limited...	Batavia	New York	30,600	
L. Littlejohn & Co., Inc.	Batavia	New York	217,800	
Pacific Trading Co.	Batavia	New York	13,500	
L. C. Gillespie & Sons..	Batavia	New York	36,000	
Mitsubishi Goshi Kaisha.	Batavia	New York	22,500	
Baird Rubber & Trading Co.	Batavia	New York	76,500	
Lewis & Peat.	Batavia	New York	30,240	
Poel & Kelly, Inc.	Batavia	New York	240,480	
John D. Lewis.	Batavia	New York	235,440	
Phelan, Borland & Fearons	Batavia	New York	69,480	
Various	Batavia	New York	492,360	
Fred Stern & Co.	Singapore	New York	116,480	2,359,880
JULY 21. By the S. S. "Lancaster" at Baltimore.				
Poel & Kelly, Inc.	Singapore	Baltimore	280,000	280,000
JULY 22. By the S. S. "Rotterdam" at New York.				
Meyer & Brown, Inc.	Rotterdam	New York	44,800	
Various	Rotterdam	New York	125,120	169,920
JULY 28. By the S. S. "Vasconia" at New York.				
Goldman, Sachs & Co...	London	New York	524,880	524,880

UNITED STATES CRUDE AND WASTE RUBBER IMPORTS FOR 1921 (BY MONTHS)

1921	Plantation	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Balata	Miscellaneous	Waste	Totals 1921	Totals 1920
January ..... *tons*	12,819	1,312	43	3	.....	.....	41	173	1,071	15,462	22,401
February	7,913	432	269	2	25	.....	25	216	37	8,919	33,984
March	12,241	1,794	377	1	.....	3	29	7	345	14,797	33,998
April	16,861	403	.....	5	.....	.....	64	226	7	17,566	24,957
May	9,127	1,570	.....	2	33	.....	40	186	41	10,999	28,666
June	12,361	1,091	.....	25	.....	.....	49	203	72	13,801	15,606
July	11,140	495	27	30	.....	.....	25	189	34	11,940	17,487
Totals, 7 months, 1921...	82,462	7,097	716	68	58	3	273	1,200	1,607	93,484	.....
Totals, 7 months, 1920...	149,098	13,924	3,644	590	504	13	327	5,937	3,062	.....	177,099

Compiled by The Rubber Association of America, Inc.

PLANTATIONS—Continued

	Shipment from:	Shipped to:	Pounds.	Totals.
JULY 28. By the S. S. "Eastern Sea" at New York.				
Various	Rotterdam	New York	279,540	279,540
JULY 28. By the S. S. "Mongolian Prince" at New York.				
J. T. Johnstone & Co., Inc.	Malacca	New York	45,000	
L. Littlejohn & Co., Inc.	Singapore	New York	495,180	
Charles T. Wilson Co., Inc.	Singapore	New York	25,200	
Poel & Kelly, Inc.	Singapore	New York	61,400	
Baird Rubber & Trading Co.	Singapore	New York	94,500	
F. R. Henderson & Co.	Singapore	New York	188,820	
East Asiatic Co., Inc.	Singapore	New York	100,800	
Peninsular Trading Agency, Inc.	Singapore	New York	72,000	
Rubber Importers & Dealers Co., Inc.	Singapore	New York	143,100	
J. T. Johnstone & Co., Inc.	Singapore	New York	54,000	
Thomas A. Desmond & Co.	Singapore	New York	295,200	
Raw Products Co.	Singapore	New York	70,200	
Adolph Hirsch & Co.	Singapore	New York	14,400	
E. G. Curry & Co., Inc.	Singapore	New York	63,360	
Ajax Rubber Co., Inc.	Singapore	New York	38,520	
Fred Waterhouse Co., Limited	Singapore	New York	8,640	
Phelan, Borland & Fearons	Singapore	New York	85,680	
Smith & Schippers, Inc.	Singapore	New York	100,800	
Meyer & Brown, Inc.	Singapore	New York	161,280	
General Rubber Co.	Singapore	New York	102,060	
The Fisk Rubber Co.	Singapore	Chicopee Falls	147,060	
Firestone Tire & Rubber Co.	Singapore	Akron	153,900	
Hood Rubber Co.	Singapore	Watertown	13,566	
Various	Singapore	New York	791,094	3,325,760
JULY 30. By the S. S. "Yamagata Maru" at New York.				
Baring Bros.	Singapore	New York	118,800	
Baird Rubber & Trading Co.	Singapore	New York	59,400	
William H. Stiles & Co.	Singapore	New York	27,000	
H. S. Seferiro & Co.	Singapore	New York	169,920	
Hood Rubber Co.	London	Watertown	89,600	464,720
AUGUST 1. By the S. S. "Ryndam" at New York.				
Meyer & Brown, Inc.	Rotterdam	New York	179,280	
Various	Rotterdam	New York	720,000	899,280
AUGUST 1. By the S. S. "Cedric" at New York.				
Various	Liverpool	New York	343,980	343,980
AUGUST 3. By the S. S. "Melville Dollar" at New York.				
Firestone Tire & Rubber Co.	Singapore	Akron	216,540	
Pacific Trading Co.	Singapore	New York	197,820	
Fred Stern & Co.	Singapore	New York	112,000	
Rubber Trading Co.	Singapore	New York	27,000	
Poel & Kelly, Inc.	Singapore	New York	22,400	
L. Littlejohn & Co., Inc.	Singapore	New York	132,120	707,880
AUGUST 3. By the S. S. "Veendyk" at New York.				
Various	Colombo	New York	401,632	
Wm. Schall & Co.	Soerabaya	New York	13,105	
Various	Soerabaya	New York	684,462	
Manhattan Rubber Mfg. Co.	Batavia	New York	34,369	
Poel & Kelly, Inc.	Batavia	New York	22,400	
Wm. Schall & Co.	Batavia	New York	31,088	
H. A. Astlett & Co.	Batavia	New York	62,000	
Various	Batavia	New York	33,826	
Hood Rubber Co.	London	Watertown	11,220	
Various	Betong Asahan	New York	213,539	
Various	Belawan-Deli	New York	177,313	1,684,954
AUGUST 4. By the S. S. "City of Lehore" at New York.				
J. Aron & Co.	Colombo	New York	20,160	
F. R. Henderson & Co.	Colombo	New York	180	
Hayley & Kenney	Colombo	New York	138,600	
Poel & Kelly, Inc.	Colombo	New York	59,000	
Goldman, Sachs & Co.	Colombo	New York	69,660	
Meyer & Brown, Inc.	Colombo	New York	78,400	
Various	Colombo	New York	578,380	
Hood Rubber Co.	London	Watertown	22,400	966,780
AUGUST 6. By the S. S. "Nieuw Amsterdam" at New York.				
Meyer & Brown, Inc.	Rotterdam	New York	22,400	
Various	Rotterdam	New York	82,650	105,050
AUGUST 6. By the S. S. "Boveric" at New York.				
Charles T. Wilson Co., Inc.	Colombo	New York	42,120	
Whittall & Co. of Ceylon	Colombo	New York	129,240	
Smith & Schippers, Inc.	Colombo	New York	284,040	
Goldman, Sachs & Co.	Colombo	New York	91,440	
H. A. Astlett & Co.	Colombo	New York	45,000	
Various	Colombo	New York	108,340	700,180
AUGUST 6. By the S. S. "Boveric" at Boston.				
Hood Rubber Co.	Ceylon	Watertown	130,160	130,160
AUGUST 6. By the S. S. "Yaka" at New York.				
The Goodyear Tire & Rubber Co.	Rotterdam	Akron	1,477,080	1,477,080
AUGUST 7. By the S. S. "Maryland" at New York.				
Fred Stern & Co.	London	New York	11,200	11,200
AUGUST 8. By the S. S. "Carmania" at New York.				
General Rubber Co.	Liverpool	New York	11,200	
Various	Liverpool	New York	46,260	57,460
AUGUST 9. By the S. S. "Topa Topa" at New York.				
Firestone Tire & Rubber Co.	Singapore	Akron	202,140	
Baird Rubber & Trading Co.	Singapore	New York	67,320	
Poel & Kelly, Inc.	Singapore	New York	186,000	
Various	Singapore	New York	76,620	532,080
AUGUST 10. By the S. S. "Clan MacLaren" at Boston.				
Various	Ceylon	Boston	172,970	172,970
AUGUST 10. By the S. S. "Clan MacLaren" at New York.				
Smith & Schippers, Inc.	Colombo	New York	63,180	
Goldman, Sachs & Co.	Colombo	New York	40,320	
H. A. Astlett & Co.	Colombo	New York	22,000	
Various	Colombo	New York	383,910	509,410
AUGUST 10. By the S. S. "Osakis" at New York.				
H. A. Astlett & Co.	Java	New York	56,000	
Hood Rubber Co.	London	Watertown	22,400	
Fred Stern & Co.	Singapore	New York	150,080	
Poel & Kelly, Inc.	Singapore	New York	82,000	310,480
AUGUST 10. By the S. S. "Medford Hall" at New York.				
Hood Rubber Co.	Ceylon	Watertown	89,900	89,900
———. By the S. S. "West Carmona" at Los Angeles.				
H. A. Astlett & Co.	Singapore	New York	56,000	56,000
———. By the S. S. "West Carmona" at San Francisco.				
H. A. Astlett & Co.	Singapore	New York	112,000	112,000
AUGUST 13. By the S. S. "Bowes Castle" at New York.				
Poel & Kelly, Inc.	Singapore	New York	250,000	
Fred Stern & Co.	Singapore	New York	33,600	
Meyer & Brown, Inc.	Singapore	New York	239,680	
Hood Rubber Co.	Singapore	Watertown	145,730	
Continental Rubber Co. of New York	Singapore	New York	44,800	713,810
AUGUST 13. By the S. S. "Noordam" at New York.				
Meyer & Brown, Inc.	Rotterdam	New York	100,800	
Poel & Kelly, Inc.	Rotterdam	New York	89,500	
Hood Rubber Co.	London	Watertown	134,332	324,632
AUGUST 18. By the S. S. "West Neris" at New York.				
Hood Rubber Co.	London	Watertown	56,530	
Fred Stern & Co.	Singapore	New York	56,000	112,530

PONTIANAK

JULY 21. By the S. S. "Lancaster" at New York.				
Fred Waterhouse Co., Limited	Soerabaya	New York	5,100	5,100
JULY 30. By the S. S. "Yamagata Maru" at New York.				
Pacific Trading Co.	Singapore	New York	110,400	110,400

AFRICANS

JULY 25. By the S. S. "Bassa" at New York.				
Fred Stern & Co.	Lagos	New York	44,800	44,800

GUTTA PERCHA

JULY 28. By the S. S. "Mongolian Prince" at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	31,500	31,500

BALATA

JULY 24. By the S. S. "Dunstan" at New York.				
Various	Pará	New York	4,350	4,350
JULY 25. By the S. S. "Mayaro" at New York.				
Middleton & Co., Limited	Cayenne	New York	5,610	5,610
JULY 31. By the S. S. "Mahopac" at New York.				
Earle Bros.	London	New York	1,200	1,200
AUGUST 7. By the S. S. "Nickerie" at New York.				
Middleton & Co., Limited	Surinam	New York	13,810	
Wm. Schall & Co.	Paramaribo	New York	3,000	16,810
AUGUST 8. By the S. S. "Carmania" at New York.				
Various	Liverpool	New York	1,200	1,200
AUGUST 11. By the S. S. "Maraval" at New York.				
Middleton & Co., Limited	Cayenne	New York	16,900	16,900

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF MAY, 1921

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Soles and Heels Value	Automobile Tires: Casings Value	Automobile Tires: Inner Tubes Value	Automobile Tires: Solid Tires Value	Automobile Tires: All Others Value	Insulated Wire and Cables Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value
EUROPE																
Azores and Madeira Islands	.....	.....	.....	.....	.....	.....	.....	$41	.....	.....	.....	.....	.....	.....	.....	$41
Belgium	$2,044	.....	$591	.....	.....	.....	.....	.....	$85	$21	.....	.....	.....	$788	$8,267	11,796
Bulgaria	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	386	386
Czechoslovakia	.....	.....	.....	.....	.....	.....	.....	.....	6,049	575	.....	.....	.....	.....	.....	6,624
Denmark	.....	$602	178	.....	.....	2,376	$2,316	1,666	10,219	183	.....	.....	.....	87	473	15,724
Finland	.....	.....	.....	.....	.....	76	100	.....	1,219	116	.....	.....	.....	.....	.....	1,435
France	1,650	879	278	.....	.....	264	219	.....	8,767	.....	.....	.....	$9,539	1,798	5,742	28,872
Germany	.....	12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	485	497
Greece	.....	.....	.....	.....	.....	.....	.....	.....	7,932	97	.....	.....	.....	.....	.....	8,029
Iceland and Faroe Islands	.....	.....	20	.....	.....	51	202	.....	.....	.....	.....	.....	.....	.....	144	477
Italy	.....	.....	767	1	$10	.....	.....	.....	.....	.....	.....	.....	6,414	126	1,353	8,610
Netherlands	3,656	720	.....	12	39	.....	.....	.....	2,491	305	$118	$12	1,203	.....	2,749	11,293
Norway	.....	3,888	105	.....	.....	14,084	13,109	1,604	84,114	1,669	930	113	795	30	798	107,155
Poland and Danzig	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	41,723	.....	.....	41,723
Portugal	.....	40	.....	.....	.....	.....	.....	.....	2,338	.....	.....	.....	126	.....	.....	2,504
Roumania	.....	.....	61	.....	.....	.....	.....	.....	131	14	.....	.....	.....	.....	.....	206
Spain	903	864	255	7	25	59	42	2,040	1,874	320	156	.....	1,519	.....	1,500	9,498
Sweden	.....	.....	.....	112	644	473	642	286	48,024	7,101	5,109	.....	348,854	859	2,223	413,742
Switzerland	.....	.....	.....	.....	.....	.....	.....	79	2,593	31	.....	.....	6,568	.....	.....	9,271
England	346	4,446	4,945	576	1,912	3,720	3,606	.....	77,986	5,794	5,006	.....	6,071	6,496	68,527	185,135
Scotland	.....	160	312	.....	.....	29,971	30,696	.....	.....	.....	.....	.....	.....	.....	2,690	33,858
Ireland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	22	22
TOTALS, EUROPE	$8,599	$11,611	$7,512	708	$2,630	$51,074	$50,932	$5,716	$253,822	$16,226	$11,319	$125	$422,812	$10,184	$95,359	$896,847
NORTH AMERICA																
Bermuda	.....	$74	$72	.....	.....	741	$1,219	$357	$18	.....	$51	$105	$87	$44	$100	$2,127
British Honduras	.....	.....	.....	.....	.....	600	720	134	381	$58	.....	.....	63	.....	.....	1,356
Canada	$2,462	9,332	2,694	812	$3,396	2,209	3,367	594	242,285	26,430	3,896	2,385	19,780	12,543	149,918	479,082
Costa Rica	.....	145	35	.....	.....	118	103	128	876	190	80	.....	455	18	184	2,214
Guatemala	85	210	.....	.....	.....	.....	.....	.....	926	368	.....	.....	2,579	19	329	4,516
Honduras	94	1,173	500	.....	.....	359	542	544	1,692	273	.....	.....	1,586	319	67	6,790
Nicaragua	306	84	96	.....	.....	564	845	425	1,117	77	.....	50	328	18	97	3,443
Panama	439	6,296	1,257	.....	.....	168	240	715	7,108	2,554	34	849	775	39	2,930	23,236
Salvador	.....	153	.....	.....	.....	.....	.....	2,185	103	.....	.....	.....	2,328	.....	7	4,806
Mexico	9,827	39,117	9,761	12	102	35,595	40,696	3,278	84,765	9,459	3,407	4,693	60,916	4,809	11,144	281,974
Miquelon, Langley, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	171	171
Newfoundland and Labrador	535	1,861	.....	1,092	2,357	1,085	1,124	905	608	36	.....	87	1,961	11	583	10,068
Barbados	.....	.....	.....	.....	.....	426	565	26	1,824	1,034	.....	790	470	38	233	4,980
Jamaica	789	396	119	.....	.....	368	310	254	16,007	615	2,110	158	2,292	172	1,534	24,755
Trinidad and Tobago	.....	34	85	.....	.....	.....	.....	.....	2,810	235	815	43	899	.....	385	5,306
Other British West Indies	.....	52	3	.....	.....	425	557	66	825	255	45	404	18,011	65	13	20,296
Cuba	3,732	3,417	1,473	62	202	12,869	14,272	11,087	76,365	10,750	29,304	1,391	95,730	2,921	5,046	255,690
Virgin Islands of United States	.....	.....	.....	1	3	2,334	3,778	10	962	293	.....	92	427	.....	24	5,589
Dutch West Indies	.....	448	.....	.....	.....	271	272	.....	836	101	.....	.....	.....	.....	40	1,697
French West Indies	.....	.....	.....	.....	.....	.....	.....	.....	.....	32	.....	.....	144	.....	4	180
Haiti	.....	8	.....	.....	.....	.....	.....	40	1,150	255	.....	.....	54	.....	54	1,561
Dominican Republic	21	741	.....	72	173	1,330	1,883	54	11,275	1,339	.....	393	38,317	234	755	55,185
TOTALS, NORTH AMERICA	$18,290	$63,571	$16,095	2,051	$6,233	59,462	$70,493	$20,802	$451,933	$54,354	$39,742	$11,440	$247,202	$21,250	$173,618	$1,195,023
OCEANIA																
Australia	$5,562	$4,022	$3,599	123	$401	.....	.....	.....	$20,285	$3,375	$2,262	$237	$18,682	$925	$3,978	$63,328
New Zealand	274	.....	446	72	584	96	$90	$2,164	18,730	1,925	4,814	6	880	301	3,745	33,059
Other British Oceania	.....	.....	262	.....	.....	72	103	.....	1,906	394	.....	.....	.....	.....	.....	2,665
French Oceania	.....	14	.....	.....	.....	577	903	15	917	82	760	60	.....	.....	55	2,806
Other Oceania	.....	.....	.....	.....	.....	288	433	.....	1,356	51	51	.....	.....	.....	91	1,982
Philippine Islands	3,936	1,526	1,045	50	187	4,586	6,174	1,751	17,620	3,227	13,804	8,301	6,136	2,131	3,274	69,112
TOTALS, OCEANIA	$9,772	$5,562	$5,352	245	$1,172	5,619	$7,703	$3,930	$60,814	$8,154	$21,691	$8,604	$25,698	$3,357	$11,143	$172,952
SOUTH AMERICA																
Argentina	$1,146	$999	$561	.....	.....	6,188	$6,828	$958	$29,406	$6,278	$3,793	.....	$21,576	$1,197	$5,488	$78,170
Bolivia	.....	224	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	127	.....	.....	351
Brazil	8,318	2,108	1,690	24	$112	613	714	1,888	6,150	209	755	.....	22,924	850	3,290	49,008
Chile	7,664	3,424	387	.....	.....	.....	.....	.....	1,608	37	.....	.....	35,904	1,191	2,671	52,886
Colombia	.....	321	724	.....	.....	1,030	1,476	.....	3,761	430	114	$789	3,665	1,985	1,495	14,760
Ecuador	.....	282	.....	.....	.....	.....	.....	.....	328	.....	.....	.....	.....	.....	.....	610
British Guiana	.....	.....	85	1	5	24	25	.....	190	.....	.....	.....	423	.....	5	733
Dutch Guiana	.....	370	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	370
Peru	1,461	2,291	330	175	790	396	430	.....	6,718	667	.....	.....	4,862	255	1,497	19,301
Uruguay	.....	.....	370	.....	.....	12,993	11,135	150	16,710	401	522	.....	10,649	64	1,873	41,874
Venezuela	485	411	127	.....	.....	.....	.....	80	5,324	572	.....	.....	2,498	96	1,098	10,691
TOTALS, SOUTH AMERICA	$19,074	$10,430	$4,214	200	$907	21,244	$20,608	$3,076	$70,195	$8,594	$5,184	$789	$102,628	$5,638	$17,417	$268,754

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORY OF THE UNITED STATES

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Soles and Heels Value	Automobile Tires Casings Value	Automobile Tires Inner Tubes Value	Automobile Tires Solid Tires Value	Automobile Tires All Others Value	Insulated Wire and Cables Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value
ASIA																
Aden	.....	.....	.....	.....	.....	.....	.....	.....	$150	.....	.....	.....	.....	.....	.....	$150
China	$694	$250	$360	.....	$9	135	$101	.....	4,408	$301	$527	.....	$42,274	$704	$6,061	55,689
Kwangtung, leased territory	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	20
Chosen	35	.....	76	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	111
British India	5,358	1,002	263	1,128	2,565	.....	$100	6,996	121	7,174	.....	$492	5,739	1,322	1,172	31,812
Straits Settlements	.....	396	.....	.....	.....	.....	.....	9,525	2,470	4,589	.....	.....	.....	135	81	17,688
Other British East Indies	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40	.....	40
Dutch East Indies	25,133	1,683	1,564	.....	35	.....	25	$8,762	2,928	18,477	.....	.....	.....	1,147	2,485	112,204
French Indo China	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	61	250	.....	61
Hongkong	.....	.....	.....	.....	72	.....	112	305	18	.....	94	3,707	11	.....	331	4,734
Japan	.....	2,329	.....	6,328	14,676	7,812	6,986	3,355	.....	805	.....	.....	440	49	14,198	42,932
Siam	.....	.....	.....	.....	.....	120	124	316	.....	.....	.....	.....	.....	84	.....	524
Turkey in Asia	.....	.....	.....	.....	.....	.....	.....	3,592	487	.....	.....	.....	.....	.....	.....	4,079
TOTALS, ASIA	$31,185	$5,695	$2,263	6,332	$14,685	9,302	$9,913	$905	$87,409	$6,325	$30,861	$4,199	$48,525	$3,731	$24,348	$270,044
AFRICA																
British West Africa	.....	.....	.....	.....	.....	.....	.....	.....	$4,924	$596	.....	.....	.....	.....	$68	$5,588
British South Africa	$25,419	$16,744	$1,971	468	$1,293	866	$757	$1,135	3,585	.....	.....	.....	$13,538	$1,137	5,320	70,899
British East Africa	.....	.....	.....	.....	.....	.....	.....	.....	3,000	921	.....	.....	.....	.....	.....	3,921
French Africa	.....	.....	30	.....	.....	.....	.....	.....	307	12	.....	.....	.....	.....	.....	349
Liberia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	88	.....	.....	88
Portuguese Africa	.....	.....	431	.....	.....	.....	.....	.....	174	.....	.....	.....	.....	.....	163	768
Egypt	.....	54	.....	.....	.....	.....	.....	.....	5,717	61	.....	.....	.....	.....	.....	6,012
TOTALS, AFRICA	$25,599	$16,798	$2,432	468	$1,293	866	$757	$1,135	$17,707	$1,590	.....	.....	$13,626	$1,137	$5,551	$87,625
GRAND TOTALS	$112,519	$113,667	$37,868	10,004	$26,920	147,567	$160,406	$35,564	$941,880	$95,243	$108,797	$25,157	$360,491	$45,297	$327,436	$2,891,245

	Belting, Hose, and Packing Value
Hawaii	$7,529
Porto Rico	5,151
TOTALS	$12,680

	Boots and Shoes Pairs	Boots and Shoes Value	Tires Automobile Value	Tires All Others Value	Insulated Wire and Cables Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value
Hawaii	.....	.....	$54,980	$1,040	.....	.....	$8,856	$72,405
Porto Rico	.....	.....	71,813	3,541	.....	.....	19,155	99,660
TOTALS	.....	.....	$126,793	$4,581	.....	.....	$28,011	$172,065

Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	May 1920 Pounds	May 1920 Value	May 1921 Founds	May 1921 Value
UNMANUFACTURED—*free*				
India rubber				
From France	229,198	$50,430	.....	.....
Netherlands	370,737	163,888	494,415	$95,660
Portugal	89,391	22,766	10,761	1,038
United Kingdom	9,017,369	4,067,994	1,320,499	205,692
Canada	3,070	1,751	226,357	102,555
Central America	19,901	7,842	.....	.....
Mexico	200,289	53,595	.....	.....
Brazil	3,216,017	824,988	3,718,340	394,466
Peru	114,308	33,794	8,541	939
Other South Am.	94,654	42,380	454	104
British E. Indies	22,843,746	11,137,937	14,596,314	2,626,236
Dutch E. Indies	7,195,829	3,177,985	3,515,157	645,231
Other countries	705,393	203,200	.....	.....
Totals	44,099,902	$19,788,550	23,890,838	$4,071,921
Balata	19,127	9,033	76,506	45,679
Guayule	206,946	42,043	75,020	15,004
Jelutong (Pontianak)	684,878	137,554	70,336	3,097
Gutta percha	246,589	48,446	165,200	28,170
Rubber scrap	1,081,244	78,757	252,311	7,531
Totals, unmanufactured	46,338,686	$20,104,383	24,530,211	$4,171,402
Chicle ..... *dutiable*	673,977	$434,554	556,658	$293,626
India rubber and gutta percha ..... *dutiable*	.....	85,417	.....	77,853
India rubber substitutes, *dutiable*	.....	.....	242	30

EXPORTS OF DOMESTIC MERCHANDISE

MANUFACTURED—				
India rubber				
Scrap and old	1,254,641	$119,018	537,450	$22,678
Reclaimed	757,178	125,814	206,123	25,772
Belting[1]	.....	256,076	.....	112,519
Hose[1]	.....	297,255	.....	113,667
Packing[1]	.....	150,001	.....	37,868
Boots[1] ..... *pairs*	22,572	74,597	10,004	26,920
Shoes[1] ..... *pairs*	756,613	659,581	147,567	160,406
Soles and heels[1]	.....	89,578	.....	35,564
Tires				
Casings[1]	.....	4,630,072	.....	941,880
Inner tubes[1]	.....	512,132	.....	95,243
Solid tires[1]	.....	403,979	.....	108,797
All other tires[1]	.....	63,996	.....	25,157
Druggists' rubber sundries[1]	.....	284,981	.....	45,297
Other rubber manufactures[1]	.....	806,036	.....	327,436
Suspenders and garters	.....	489,285	.....	45,816
Totals, manufactured	.....	$8,962,401	.....	$2,125,020
Fountain pens ..... *number*	42,107	$35,133	3,474	$1,985
Insulated wire and cables	.....	791,303	.....	860,491

EXPORTS OF FOREIGN MERCHANDISE

UNMANUFACTURED—				
India rubber	550,755	$239,368	930,283	$206,139
Balata	202,100	121,460	19,637	7,305
Jelutong (Pontianak)	92,940	18,478	42,000	5,231
Gutta percha	1	2	.....	.....
Rubber scrap	.....	.....	6,720	672
Totals, unmanufactured	845,796	$379,308	998,640	$219,347
MANUFACTURED—				
Gutta percha and india rubber	.....	$149	.....	$2,919
India rubber substitutes	125	30	.....	.....
Totals, manufactured	.....	$179	.....	$2,919
Chicle	.....	.....	50,200	$22,590

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES

MANUFACTURED—				
To Alaska				
Belting, hose, and packing	.....	$25,431	.....	$6,752
Boots and shoes ..*pairs*	504	1,588	4,715	15,053
Other rubber goods	.....	3,856	.....	3,310
Totals	.....	$30,875	.....	$25,115
To Hawaii				
Belting, hose, and packing	.....	$18,873	.....	$7,529
Automobile tires	.....	92,078	.....	54,980
Other tires	.....	14,516	.....	1,040
Other rubber goods	.....	19,235	.....	17,717
Totals	.....	$144,702	.....	$81,266
To Porto Rico				
Belting, hose, and packing	.....	$10,119	.....	$5,151
Automobile tires	.....	89,751	.....	71,813
Other tires	.....	9,509	.....	3,541
Other rubber goods	.....	20,933	.....	25,122
Totals	.....	$130,312	.....	$105,627

[1] Details of exports of domestic merchandise by countries during May, 1921, appear on this and the preceding page.

CUSTOM HOUSE STATISTICS

NEW YORK

IMPORTS

	June 1920 Pounds	June 1920 Value	June 1921 Pounds	June 1921 Value
UNMANUFACTURED—*free*				
Crude rubber				
From Belgium	75,335	$29,674	49,595	$1,075
France	275,975	80,334	.....	.....
Netherlands	1,928,772	904,276	941,378	174,884
Portugal	598,664	123,667	.....	.....
Spain	165	41	.....	.....
England	5,408,155	2,354,919	1,357,917	211,549
Canada	777	389	.....	.....
Costa Rica	1,613	639	.....	.....
Guatemala	902	226	.....	.....
Nicaragua	12,366	3,389	.....	.....
Panama	450	135	.....	.....
Mexico	20,357	13,025	.....	.....
Trinidad	83	33	.....	.....
Bolivia	4,132	2,193	.....	.....
Brazil	2,264,845	631,506	2,215,989	242,286
Colombia	82,875	24,136	366,712	41,315
Ecuador	23,082	6,656	42,524	5,552
Dutch Guiana	12,048	8,189	.....	.....
Peru	.....	.....	22,594	2,431
Venezuela	2,861	1,743	.....	.....
China	100,800	40,344	50,957	11,624
British India	391,826	182,582	487,050	63,656
Straits Settlements	14,348,557	6,509,587	21,910,519	3,887,366
British East Indies	4,367,387	2,096,661	2,377,632	293,920
Dutch East Indies	5,778,264	2,644,246	3,616,981	665,050
Australia	900	463	.....	.....
Philippine Islands	42,959	14,250	39,558	5,000
Totals	35,744,150	$15,673,305	33,479,406	$5,605,708
Balata	141,683	88,261	124,832	72,661
Jelutong (Pontianak)	1,202,096	203,113	249,236	11,541
Gutta percha	645,880	120,551	196,231	25,156
Totals	37,733,809	$16,085,230	34,049,705	$5,715,066
Rubber scrap and reclaimed	669,182	36,883	149,925	2,167
Totals, unmanufactured	38,402,991	$16,122,113	34,199,630	$5,717,233
Manufactures of rubber and gutta percha	.....	$104,856	.....	$49,693
Rubber substitutes	24	25	.....	.....
Chicle ...*dutiable*	201,321	110,715	132,021	65,295

EXPORTS

MANUFACTURED				
Automobile and other tires	.....	$2,302,386	.....	$640,719
Inner tubes	.....	228,805	.....	34,578
Belting, hose, and packing	.....	341,243	.....	113,775
Rubber boots and shoes.*pairs*	375,065	393,559	44,678	57,355
Soles and heels	.....	47,999	.....	20,911
Druggists' sundries	.....	86,110	.....	30,812
Other rubber manufactures	.....	453,726	.....	233,687
Totals, manufactured	.....	$3,853,828	.....	$1,131,837
Insulated wire	.....	$423,154	.....	$561,546
UNMANUFACTURED—*free*				
Rubber scrap and reclaimed	321,663	$39,235	263,333	$19,574

FOREIGN EXPORTS

Crude rubber	.....	.....	3,154	$501
Balata	.....	.....	4,396	2,506
Rubber scrap and reclaimed	.....	.....	224,283	31,400

MASSACHUSETTS

IMPORTS

UNMANUFACTURED—*free*				
Crude rubber				
From England	252,220	$79,132	.....	.....
British East Indies	108,540	35,835	251,190	$20,399
Straits Settlements	.....	.....	78,400	10,766
Totals	360,760	$114,967	329,590	$31,165
Gutta percha	.....	.....	21,000	4,407
Rubber scrap and reclaimed	28,592	2,110	.....	.....
Totals, unmanufactured	389,352	$117,077	350,590	$35,572
Rubber manufactures.*dutiable*	.....	$6,498	.....	$2,139

EXPORTS

	June 1920 Pounds	June 1920 Value	June 1921 Pounds	June 1921 Value
MANUFACTURED				
Automobile and other tires	.....	$2,603	.....	$10,775
Inner tubes	.....	253	.....	827
Belting, hose, and packing	.....	7,810	.....	1,673
Rubber boots and shoes.*pairs*	327,820	298,526	6,713	12,216
Soles and heels	.....	3,676	.....	4,087
Druggists' sundries	.....	7,546	.....	2,065
Other rubber manufactures	.....	38,828	.....	19,492
Totals, manufactured	.....	$359,242	.....	$51,135
Insulated wire	.....	$113,339	.....	$1,405
Rubber scrap and reclaimed	149,435	13,538	.....	.....

BUFFALO

IMPORTS

Rubber scrap and reclaimed	82,763	$3,206	107,649	$2,414
Rubber manufactures.*dutiable*	.....	2,410	.....	19,487
Rubber substitutes...*dutiable*	.....	2	.....	.....

EXPORTS

MANUFACTURED				
Automobile and other tires	.....	$177,117	.....	$20,590
Inner tubes	.....	93,885	.....	1,137
Belting, hose, and packing	.....	21,487	.....	9,973
Rubber boots and shoes.*pairs*	2,618	9,061	1,019	2,225
Soles and heels	.....	2,870	.....	85
Druggists' sundries	.....	10,989	.....	4,630
Other rubber manufactures	.....	131,729	.....	58,940
Totals, manufactured	.....	$447,138	.....	$97,580
Insulated wire	.....	$5,087	.....	$5,908
Rubber scrap and reclaimed	431,166	61,434	43,875	5,654

FOREIGN EXPORTS

Crude rubber	878,741	$91,915	469,964	$93,869
Jelutong (Pontianak)	52,847	9,912	.....	.....
Guayule	50	43	.....	.....
Rubber scrap and reclaimed	781	234	.....	.....
Chicle	2,895	1,013	.....	.....

PHILADELPHIA

IMPORTS

Rubber scrap and reclaimed	1,000	$150	.....	.....
Rubber manufactures.*dutiable*	.....	.....	.....	$222

EXPORTS

MANUFACTURED				
Automobile and other tires	.....	$52,305	.....	$5,139
Inner tubes	.....	2,390	.....	1,208
Belting, hose, and packing	.....	45,096	.....	170
Soles and heels	.....	3,683	.....	.....
Druggists' sundries	.....	2,058	.....	.....
Other rubber manufactures	.....	7,190	.....	387
Totals, manufactured	.....	$112,723	.....	$6,904

FOREIGN EXPORTS

Rubber manufactures	.....	$1,046	.....	.....

NEW ORLEANS

IMPORTS

Chicle ...*dutiable*	3,267	$2,641	.....	.....

EXPORTS

MANUFACTURED				
Automobile and other tires	.....	$50,413	.....	$14,804
Inner tubes	.....	16,690	.....	3,888
Belting, hose, and packing	.....	8,712	.....	23,324
Rubber boots and shoes.*pairs*	23,529	26,062	5,488	9,787
Soles and heels	.....	1,088	.....	311
Druggists' sundries	.....	84	.....	650
Other rubber manufactures	.....	6,624	.....	1,038
Totals, manufactured	.....	$109,673	.....	$53,802
Insulated wire	.....	$10,992	.....	$2,003

OHIO

IMPORTS

UNMANUFACTURED—*free*				
Crude rubber				
From Straits Settlements	1,116,526	$606,298	.....	.....
Dutch East Indies	77,690	39,446	.....	.....
Totals	1,194,216	$645,744	.....	.....
Rubber scrap and reclaimed	57,401	7,626	.....	.....
Totals unmanufactured	1,251,617	$653,370	.....	.....
Chicle ...*dutiable*	5,610	$3,832	.....	.....
Rubber manufactures.*dutiable*	.....	1,458	.....	$341

EXPORTS

	June 1920 Pounds	June 1920 Value	June 1921 Pounds	June 1921 Value
MANUFACTURED				
Belting, hose, and packing	.....	.....	.....	$46
Other rubber manufactures	.....	.....	.....	51
Totals, manufactured	.....	.....	.....	$97

SAN FRANCISCO

IMPORTS

UNMANUFACTURED—*free*				
Crude rubber				
From Straits Settlements	1,650,023	$791,134	179,225	$23,812
Hongkong	204	80	.....	.....
Dutch East Indies	.....	.....	27,988	4,746
Totals	1,650,227	$791,214	207,213	$28,558
Rubber scrap and reclaimed	.....	.....	118	10
Totals, unmanufactured	1,650,227	$791,214	207,331	$28,568
Rubber manufactures.*dutiable*	.....	$622	.....	$1,153

EXPORTS

MANUFACTURED				
Automobile and other tires	.....	$332,582	.....	$62,866
Inner tubes	.....	65,064	.....	2,026
Belting, hose, and packing	.....	128,394	.....	20,904
Rubber boots and shoes.*pairs*	9,495	9,208	3,602	4,099
Soles and heels	.....	6,568	.....	.....
Druggists' sundries	.....	1,752	.....	1,973
Other rubber manufactures	.....	15,003	.....	7,923
Totals, manufactured	.....	$558,571	.....	$99,791
Insulated wire	.....	$14,424	.....	$1,979
Rubber scrap and reclaimed	74,067	2,667	.....	.....

WASHINGTON

IMPORTS

UNMANUFACTURED—*free*				
Crude rubber				
From Canada	307,004	$318,422	.....	.....
British India	154,140	161,840	.....	.....
Straits Settlements	1,119,661	580,705	.....	.....
Hongkong	160	64	.....	.....
Japan	.....	.....	118,720	$14,795
Totals	1,580,965	$1,061,031	118,720	$14,795
Rubber scrap and reclaimed	144,000	24,697	.....	.....
Totals, unmanufactured	1,724,965	$1,085,728	118,720	$14,795
Rubber manufactures.*dutiable*	.....	$46	.....	$675

EXPORTS

MANUFACTURED				
Automobile and other tires	.....	$151,453	.....	$17,685
Inner tubes	.....	18,446	.....	955
Belting, hose, and packing	.....	5,313	.....	5,079
Rubber boots and shoes.*pairs*	757	3,404	512	1,242
Soles and heels	.....	4,286	.....	.....
Druggists' sundries	.....	561	.....	83
Other rubber manufactures	.....	2,337	.....	1,649
Totals, manufactured	.....	$185,800	.....	$26,693
Insulated wire	.....	$2,337	.....	$469
Rubber scrap and reclaimed	63,044	2,571	127,230	2,596

CHICAGO

IMPORTS

Rubber manufactures.*dutiable*	.....	$13,325	.....	$3,535
Chicle.....*dutiable*	1,189,312	776,872	535,130	300,017

MICHIGAN

IMPORTS

Rubber scrap and reclaimed	5,000	$100	.....	.....
Rubber manufactures.*dutiable*	.....	7,840	.....	$177

EXPORTS

MANUFACTURED				
Automobile and other tires	.....	$36,855	.....	$2,424
Inner tubes	.....	6,475	.....	1,361
Belting, hose, and packing	.....	3,110	.....	1,341
Rubber boots and shoes.*pairs*	3,924	13,397	810	2,780
Soles and heels	.....	54	.....	.....
Druggists' sundries	.....	436	.....	456
Other rubber manufactures	.....	15,091	.....	5,861
Totals, manufactured	.....	$75,418	.....	$14,223
Insulated wire	.....	$3,779	.....	$974
Rubber scrap and reclaimed	42,433	1,123	.....	.....

IMPORTS OF CRUDE RUBBER INTO THE UNITED STATES BY CUSTOMS DISTRICTS

CUSTOMS DISTRICTS	July, 1921 Pounds	July, 1921 Value
Buffalo	30,624	$3,369
New York	26,811,807	4,079,870
Maryland	280,000	37,108
San Diego	35,581	16,719
Los Angeles	489,862	77,393
Totals	27,647,874	$4,214,459

RUBBER STATISTICS FOR THE DOMINION OF CANADA

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	May 1920 Pounds	May 1920 Value	May 1921 Pounds	May 1921 Value
UNMANUFACTURED—*free:*				
Rubber, gutta percha, etc.:				
From United Kingdom	647,441	$358,376	200	$90
United States	584,654	248,669	764,990	132,854
Belgium	12,023	6,302	.....	.....
Belgian Congo	33,400	17,434	.....	.....
Brazil	129,506	64,146	.....	.....
British East Indies—				
India	33,493	16,760	11,220	2,215
Straits Settlements	508,740	265,161	604,393	130,967
France	54,313	26,576	.....	.....
Total	2,003,570	$1,003,424	1,380,803	$266,126
Balata	51	74	.....	.....
Rubber, recovered	358,705	65,593	144,990	16,311
Rubber, powdered, and rubber or gutta percha scrap	313,936	22,524	104,952	2,522
Rubber substitutes	107,001	14,917	28,183	7,234
Totals, unmanufactured	2,783,263	$1,106,532	1,658,928	$292,193
PARTLY MANUFACTURED—				
Hard rubber sheets and rods	7,733	$5,127	598	$641
Hard rubber tubes	.....	4,365	.....	2,589
Rubber thread, not covered	3,017	4,491	2,909	3,380
Totals, partly manufactured	10,750	$13,983	3,507	$6,610
MANUFACTURED—				
Belting	.....	$17,405	.....	$3,853
Hose	.....	12,914	.....	5,102
Packing	.....	5,704	.....	3,663
Boots and shoes	.....	19,494	.....	5,598
Clothing, including waterproofed	.....	19,463	.....	10,359
Gloves	.....	1,237	.....	1,285
Hot-water bottles	.....	2,913	.....	273
Tires, solid	.....	37,505	.....	7,881
Tires, pneumatic	.....	116,839	.....	122,371
Inner tubes	.....	13,034	.....	9,586
Elastic, round or flat	.....	49,366	.....	22,514
Mats and matting	.....	137	.....	1,652
Cement	.....	5,784	.....	2,324
Other rubber manufactures	.....	171,532	.....	113,309
Totals, manufactured	.....	$473,327	.....	$309,770
Totals, rubber imports	2,794,013	$1,593,842	1,662,435	$608,573
Insulated wire and cables—				
Wire and cables covered with cotton, linen, silk, rubber, etc.	.....	$21,824	.....	$10,251
Copper wire and cables, covered as above	.....	17,690	.....	17,331
Chicle	34,088	17,536	50,600	22,748
Fillets	.....	573	.....	1,533
Webbing	.....	57,980	.....	20,959
Fountain pens	.....	3,627	.....	1,679

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS

	May 1920 Produce of Canada Value	May 1920 Reexports of Foreign Goods Value	May 1921 Produce of Canada Value	May 1921 Reexports of Foreign Goods Value
UNMANUFACTURED—				
Crude and waste rubber	$22,738	.....	$9,334	$95,072
MANUFACTURED—				
Belting	$7,195	.....	$379	.....
Hose	9,377	.....	38,225	.....
Boots and shoes	66,455	$115	36,328	53
Clothing, including waterproofed	4,282	509	8,916	549
Tires, pneumatic	587,475	.....	266,592	.....
Tires	1,987	7,064	4,360	12,629
Other manufactures	30,802	348	19,174	1,602
Totals, manufactured	$707,573	$8,036	$373,974	$14,833
Totals, rubber exports	$730,311	$8,036	$383,308	$109,905

UNITED KINGDOM RUBBER STATISTICS

IMPORTS

	June 1920 Pounds	June 1920 Value	June 1921 Pounds	June 1921 Value
UNMANUFACTURED—				
Crude rubber				
From—				
Straits Settlements	5,559,800	£609,286	3,457,100	£142,841
Federated Malay States	6,293,700	708,308	2,618,500	121,228
British India	1,703,600	191,797	497,400	21,060
Ceylon and dependencies	2,597,500	283,437	1,524,500	64,817
Other Dutch possessions in Indian Seas	1,084,900	122,756	1,647,300	78,110
Dutch East Indies (except other Dutch possessions in Indian Seas)	2,571,600	289,365	3,005,500	135,433
Other countries in East Indies and Pacific, not elsewhere specified	234,000	26,223	184,000	8,948
Brazil	2,025,000	195,242	232,300	10,550
Peru	160,000	15,200	.....	.....
South and Central America (except Brazil and Peru)	47,900	5,011	600	18
West Africa				
French West Africa	3,400	230	4,400	131
Gold Coast	15,900	1,726	800	27
Other parts of West Africa	163,200	24,989	.....	.....
East Africa, including Madagascar	94,700	9,547	.....	.....
Other countries	293,500	25,632	18,400	846
Totals	22,848,700	£2,508,749	13,190,800	£584,009
Waste and reclaimed rubber	907,100	14,343	15,700	570
Totals, unmanufactured	23,755,800	£2,523,092	13,206,500	£584,579
Gutta percha and balata	1,482,000	£333,677	268,700	£53,912
Rubber substitutes	58,200	2,040	.....	.....
MANUFACTURED—				
Boots and shoes..*doz. pairs*	47,584	£99,607	6,200	£7,573
Waterproof clothing	.....	611	.....	1,431
Insulated wire	.....	182	.....	1,953
Tires and tubes	.....	500,220	.....	228,801
Other rubber manufactures	.....	47,726	.....	43,369

EXPORTS

UNMANUFACTURED—				
Waste and reclaimed rubber	1,338,600	£35,063	243,200	£5,524
Rubber substitutes	168,100	9,225	24,600	545
Totals	1,506,700	£44,288	267,800	£6,069
MANUFACTURED—				
Boots and shoes..*doz. pairs*	7,655	£17,194	2,826	£6,488
Waterproof clothing	.....	216,359	.....	60,303
Insulated wire	.....	140,762	.....	77,631
Submarine cables	.....	416,853	.....	63,333
Tires and tubes	.....	500,220	.....	228,801
Other rubber manufactures	.....	441,224	.....	150,471

EXPORTS—COLONIAL AND FOREIGN

UNMANUFACTURED—				
Crude rubber				
To Russia	10,300	£1,000	2,200	£93
Sweden, Norway and Denmark	413,900	39,375	113,600	5,119
Germany	1,078,900	102,999	1,241,000	36,744
Belgium	516,000	63,104	407,100	12,309
France	2,842,900	310,716	419,200	15,792
Spain	45,400	4,744	12,600	567
Italy	370,500	38,834	110,100	3,077
Austria-Hungary	10,800	1,328	56,500	1,521
Other European countries	607,200	59,766	590,000	18,402
United States	5,021,600	574,185	1,083,600	40,044
Canada	1,478,400	167,076	38,100	1,645
Other countries	286,300	32,375	13,500	640
Totals, rubber	12,682,200	£1,395,502	4,087,800	£135,953
Waste and reclaimed rubber	17,900	£1,190	.....	.....
Gutta percha and balata	109,900	19,270	28,600	£3,730
Rubber substitutes	6,900	160	2,300	45
MANUFACTURED—				
Boots and shoes..*doz. pairs*	793	£4,636	1	£5
Tires and tubes	.....	40,376	.....	29,951
Other rubber manufactures	.....	2,006	.....	4,028

RUBBER STATISTICS FOR THE NETHERLANDS

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	Eleven Months Ended November 1919 Kilos[1]	1919 Gilders[2]	1920 Kilos	1920 Gilders
UNMANUFACTURED—				
Wild rubber				
From Great Britain	73,460		28,373	
French Congo	149,186		.....	
Brazil	141,255		139,036	
United States	5,212	1,104,018	31,040	691,926
Belgian Congo	91,923		73,457	
Other countries	104,997		87,334	
Totals	566,033	1,104,018	359,240	691,926

	Eleven Months Ended November 1919 Kilos[1]	1919 Gilders[2]	1920 Kilos	1920 Gilders
UNMANUFACTURED—				
Plantation rubber—				
From Great Britain	1,114,921		196,870	
Netherlands E. Indies	3,222,256		9,949,122	
Indian Empire	442,308	11,419,110	30,929	23,047,685
Other countries	66,979		204,629	
Totals	4,846,464	11,419,110	10,381,550	23,047,685
Rubber scrap	1,109,562	394,691	300,762	75,675
Reclaimed rubber	5,948	9,994	38,475	55,870
Hard rubber	1,602	7,156	2,651	11,824
Jelutong (Pontianak)	.....	.....	42,206	20,675
Balata	25,479	117,858	94,002	476,265
Gutta percha and gutta percha waste	8,040	20,212	2,575	5,904
Totals unmanufactured	6,563,128	13,073,039	11,221,461	24,385,824
MANUFACTURED—				
Automobile tires and tubes:				
From Germany	321		4,576	
Belgium	27,771		63,003	
Great Britain	308,805	4,943,780	188,332	6,936,045
France	96,198		94,917	
United States	339,245		707,636	
Other countries	779	.....	28,997	.....
Motorcycles tires and tubes:				
From Germany	163		1,089	
Belgium	421		16,325	
Great Britain	59,419		36,615	
France	8,189	580,138	6,073	405,829
United States	29,897		14,997	
Other countries	1,885		3,062	
Bicycle tires and tubes:				
From Germany	1,955		81,924	
Belgium	27,588		107,295	
Great Britain	647,611		316,775	
France	192,069	5,517,951	185,699	3,739,304
United States	11,960		4,626	
Other countries	37,887		59,925	
Solid tires and cushion tires:				
From Great Britain	117,397		237,934	
United States	8,627	250,336	56,689	636,531
Other countries	1,123		25,311	
Rubbered goods	385,780	1,679,405	361,767	1,850,690
Manufactures of gutta percha	48,034	276,541	114,354	481,376
Rubbered clothing for men and boys	95,718	1,007,282	226,742	2,628,648
Rubbered clothing for women and girls	34,762	447,146	78,754	1,008,023
Rubbered collars, cuffs, etc	2,669	24,725	434	3,918
Boots and shoes	.....	.....	211,371	638,775
Insulated wire and cables	7,428,369	6,883,922	23,594,120	21,524,932
Hard rubber goods	6,016	17,359	12,473	90,452
Other rubber goods	406,485	1,336,642	856,274	2,802,700
Totals manufactured	.....	22,965,227	.....	42,747,223
Total imports	.....	36,038,266	.....	67,133,047

EXPORTS OF CRUDE AND MANUFACTURED RUBBER

UNMANUFACTURED—				
Wild rubber:				
To Germany	59,694		434,365	
Austria	.....	146,254	89,013	1,105,747
Other countries	7		51,682	
Totals	59,701	146,254	575,060	1,105,747
Plantation rubber:				
To Germany	1,274,339		3,130,954	
United States	1,090,246	6,826,330	2,088,556	12,663,066
Other countries	112,822		449,666	
Totals	2,477,407	6,826,330	5,669,176	12,663,066
Scrap	119,116	56,067	146,971	58,253
Hard rubber	496	3,064	353	2,515
Jelutong (Pontianak)	.....	.....	21,390	14,100
Balata	54,047	271,580	110,801	576,865
Gutta percha and gutta percha waste	29,729	25,800	12,632	88,918
Totals, unmanufactured	2,740,496	7,329,095	6,536,383	14,509,504
MANUFACTURED—				
Automobile tires and tubes:				
To Germany	57,722		12,605	
Sweden	3,159		7,734	
Norway	1,205		4,238	
Switzerland	.....		9,247	
Belgium	2,561	726,823	3,074	571,760
Dutch East Indies	240		12,346	
Great Britain	1,425		13,812	
France	.....		8,411	
Other countries	710		13,673	
Motorcycle tires and tubes:				
To Sweden	115		1,237	
Great Britain	10	4,437	1,190	29,792
United States	.....		1,632	
Other countries	373		1,537	
Bicycle tires and tubes:				
To Great Britain	118		19,855	
Dutch East Indies	1,219		20,284	
Sweden	1,540		39,669	
Switzerland	5,735	113,129	19,235	752,067
Germany	8,836		34,135	
Belgium	12		16,597	
Other countries	591		9,800	
Solid tires and cushion tires:				
To Germany	3,775		1,396	
Great Britain	149	19,045	2,412	16,270
Other countries	1,410		2,882	
Rubbered goods	10,586	38,759	13,969	64,250

	Eleven Months Ended November			
	1919		1920	
	Kilos[1]	Gilders[2]	Kilos	Gilders
MANUFACTURED—				
Manufactures of gutta percha.	263	2,611	4,960	41,760
Rubbered clothing for men and boys	3,167	33,300	22,768	264,678
Rubbered clothing for women and girls	1,486	23,604	12,754	145,993
Boots and shoes	.....	.....	2,445	5,290
Insulated wire and cables	564,009	1,806,671	829,739	2,350,101
Hard rubber goods	52,432	54,983	850	5,510
Other rubber goods	33,800	185,260	37,352	152,568
Totals, manufactured	.....	3,008,622	.....	4,400,039
Total exports	.....	10,337,717	.....	18,909,543

[1]One kilo equals 2.2 pounds.
[2]One gilder equals $0.40 (normal).

RUBBER STATISTICS FOR ITALY

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	Two Months Ended February			
	1920		1921	
	Quintals[1]	Lire[2]	Quintals	Lire
UNMANUFACTURED—				
Crude rubber and gutta percha—raw and reclaimed:				
From Great Britain	28		112	
Netherlands	.....		1,815	
French Asiatic Colonies	898		.....	
Indian and Ceylon	674		428	
Dutch East Indies	.....	3,897,850	548	7,980,000
Straits Settlements	923		4,965	
French African Colonies	381		.....	
Belgian Congo	142		.....	
Brazil	942		299	
Other countries	115		233	
Totals	4,103	3,897,850	8,400	7,980,000
Rubber scrap	11	1,650	.....	.....
Totals, unmanufactured	4,114	3,899,500	8,400	7,980,000
MANUFACTURED—				
India rubber and gutta percha—				
Threads	17	49,300	75	217,500
Sheets, including hard rubber	10	18,100	3	5,700
Tubes	8	11,200	104	145,200
Belting	177	292,050	67	110,550
Rubber-coated fabrics in pieces	49	101,800	91	197,000
Boots and shoes.....*pairs*	19,730	394,600	110	2,200
Elastic webbing	12	40,800	50	170,000
Clothing and articles for travel	25	100,000	20	80,000
Tires and tubes:				
From Belgium	148		.....	
France	50		1,060	
Great Britain	633	2,886,800	591	4,771,200
United States	200		8	
Other countries	....		45	
Other rubber goods	1,179	2,204,700	996	1,884,500
Totals, manufactured	.....	6,099,250	.....	7,583,850
Totals imports	.....	9,998,850	.....	15,563,850

EXPORTS OF CRUDE AND MANUFACTURED RUBBER

UNMANUFACTURED—				
India rubber and gutta percha—raw and reclaimed:				
To Austria	300		.....	
France	.....		2,352	
Spain	.....	395,000	253	1,327,500
United States	490		.....	
Other countries	.....		50	
Totals	790	395,000	2,655	1,327,500
Waste	655	131,000	488	97,600
Totals, unmanufactured	1,445	526,000	3,143	1,425,100
MANUFACTURED—				
India rubber and gutta percha—				
Threads	76	245,600	38	117,800
Sheets, including hard rubber	59	89,200	34	58,600
Tubes	166	220,250	249	316,250
Belting	.....	.....	7	14,700
Rubber-coated fabrics in pieces	27	81,000	29	87,000
Boots and shoes.....*pairs*	445	8,900	.....	.....
Other	1	1,500	.....	.....
Elastic webbing	180	684,000	141	535,800
Clothing and articles for travel	63	315,000	11	55,000
Tires and tubes:				
To Austria	108		282	
Belgium	110		431	
Czecho-Slovakia	278		41	
Denmark	148		.....	
France	157		7	
Great Britain	1,616		2,366	
Netherlands	96		46	
Rumania	186		442	
Spain	76	14,075,000	95	13,700,000
Switzerland	116		15	
India and Ceylon	689		396	
Dutch East Indies	447		636	
Straits Settlements	192		7	
Australia	170		.....	
Argentina	428		393	
Brazil	445		9	
Other countries	368		314	

	Two Months Ended February			
	1920		1921	
	Quintals[1]	Lire[2]	Quintals	Lire
Other rubber goods	1,529	2,814,200	2,844	5,266,600
Totals, manufactured	.....	18,534,650	.....	20,151,750
Total exports	.....	19,060,650	.....	21,576,850

[1]One quintal equals 220.46 pounds.
[2]One lira equals $0.193 (normal).

THE MARKET FOR RUBBER SCRAP

NEW YORK

THE situation remains depressed and must so continue while abnormal industrial conditions prevail. The demand for scrap by domestic reclaimers is very limited. Bids for mixed tires from dealers run about 75 cents a 100 pounds. Other descriptions of scrap are practically at a standstill. There is no export movement and no foreign inquiry.

QUOTATIONS FOR CARLOAD LOTS DELIVERED

August 25, 1921

Prices subject to change without notice

BOOTS AND SHOES				
Boots and shoes	*lb.*	$0.03¼	@	.03½
Trimmed arctics	*lb.*	.02½	@	
Untrimmed arctics	*lb.*	*.02	@	
HARD RUBBER				
Battery jars, black compound	*lb.*	*.07½	@	
No. 1, bright fracture	*lb.*	*.12	@	.15
INNER TUBES				
No. 1	*lb.*	.05½	@	
Compounded	*lb.*	.03¾	@	
Red	*lb.*	.03½	@	
MECHANICALS				
Black scrap, mixed, No. 1	*lb.*	*.02¼	@	.03
No. 2	*lb.*	*.01½	@	.02
Heels	*lb.*	*.02½	@	.03
Horse-shoe pads	*lb.*	*.02½	@	.03
Hose, air brake	*lb.*	*.01	@	.01½
fire, cotton lined	*lb.*	*.01	@	
garden	*lb.*	.07	@	
Matting	*lb.*	*.01	@	
Red packing	*lb.*	*.04½	@	.05
Red scrap, No. 1	*lb.*	*.07	@	.08
No. 2	*lb.*	*.05½	@	.06
White scrap, No. 1	*lb.*	*.07	@	.07½
No. 2	*lb.*	*.06	@	.06½
TIRES				
PNEUMATIC—				
Auto peelings	*lb.*	*.02	@	.02¼
Bicycle	*lb.*	*.01½	@	.02
Standard white auto	*lb*	*.02¼	@	.02¾
Mixed auto	*lb.*	*.01	@	.01½
Stripped, unguaranteed	*lb*	*.01	@	.01½
White, G. & G., M. & W., and U. S.	*lb.*	*.02¼	@	
SOLID—				
Carriage	*lb.*	*.02¼	@	.02¾
Iron	*lb.*		@	
Truck, clean	*lb.*	*.01½	@	.02

*Nominal.

THE MARKET FOR COTTON AND OTHER FABRICS

NEW YORK

PROSPECTS of the smallest crop in years is the unfavorable outlook for American cotton at the present time. This feature, together with increased foreign buying, has given strength to the market and prices have advanced. On August 1, spot middling upland was quoted at 12.90 cents as compared with 40 cents a year ago. On August 23, quotations on this grade were 13.75 cents, a gain of 85 points since the first of the month.

EGYPTIAN COTTON. The market for Sakellarides and uppers was rather weak early in the month but later developed firmness. Business has been done in the latter grade around 16 to 17 cents, c. i. f., Boston.

Practically all medium and low-grade uppers have been sold and the stock in Alexandria is chiefly composed of better grades.

There are some spot uppers in this country but holders are very firm in their idea of price. Sakellarides, on the other hand, has been neglected excepting the higher grades. There is a large stock of Sakel cotton in this country, and also in Alexandria, composed almost entirely of medium-grade cotton. Medium-grade Sakel can be bought around 23 cents c. i. f., Boston, ex-duty, but top grades are at a premium of 10 to 15 cents, which is out of proportion and indicates the scarcity of very high-grade cotton carrying good staple. There has been a great deal of talk about the so-called short-staple Sakel, but some of these lots were found to be either Pillion cotton or a very poor quality of Sakel such as is sometimes grown in upper Egypt or on poor land in other districts. The last crop produced a great deal of poor-staple cotton and according to reports the present crop is expected to show somewhat the same out-turn.

SEA ISLAND COTTON. The latest report from the Sea Island district indicates a crop of possibly four to five thousand bales this season. It is believed that extra choice could be purchased at 40 cents.

ARIZONA COTTON. The Arizona market has been strengthened somewhat by the proposed export of a fair quantity of the carry-over of the last crop. It is believed, however, that No. 2 grade can be bought in fair quantity at 28 to 29 cents. There has been no change from estimates of 30,000 bales for the present crop, but with the carry-over there should be nearly 75,000 bales available for spinners this season. Altogether it would look as though extra staples were in abundant supply while medium staples such as 1-3/16 to 1¼-inch cotton might be hard to buy within the next six to twelve months.

MECHANICAL DUCKS AND DRILLS. The demand is broadening for these fabrics. The market has been strong and active. Prices have advanced in accordance with the new range of cotton values.

RAINCOAT FABRICS. Business has improved considerably since last month when only two or three fabrics were in demand, while present inquiries cover an extended line. Small quantity buying and repeated orders seem to be the general rule. Price revision is downward.

SHEETINGS The market on sheetings, particularly the light weight, is very firm and advancing and deliveries within sixty days are hard to obtain. The mills being comfortably sold for 60 days are unwilling to contract beyond that time unless at an advance in present prices. A good fall business is expected.

TIRE FABRICS. There has been no change in the tire fabric situation, which continues to be unsettled. Buying has been for immediate requirements and prices are governed by the needs of the buyer and the willingness of the holder to sell.

TIRE
FABRICS

JENCKES
SPINNING
COMPANY

PAWTUCKET
RHODE ISLAND

AKRON OFFICE
Second National Building

NEW YORK OFFICE
25 West 43d Street

NEW YORK QUOTATIONS

August 25, 1921

Prices subject to change without notice

BURLAPS				
32—7-ounce	100 *yards*		@	
32—8-ounce			@	
40—7½-ounce		$3.50	@	3.55
40—8-ounce		3.55	@	3.60
40—10-ounce		4.40	@	4.45
40—10½-ounce		4.45	@	4.50
45—7½-ounce			@	
45—8-ounce			@	
45—10-ounce			@	
DRILLS				
38-inch 2.00-yard	*yard*	.16	@	
40-inch 3.47-yard		.10	@	
52-inch 1.90-yard		.18	@	
52-inch 1.95-yard		.17½	@	
60-inch 1.52-yard		.22½	@	
DUCK				
CARRIAGE CLOTH				
38-inch 2.00-yard enameling duck	*yard*	.16	@	
30-inch 1.74-yard		.18	@	
72-inch 16.66-ounce		.35	@	
72-inch 17.21-ounce		.36½	@	
MECHANICAL				
Hose	*pound*	.30	@	
Belting		.36	@	
HOLLANDS, 40-INCH				
DEAD FINISH				
Piece		.20	@	
Cut		.25	@	
FLAT FINISH				
Piece		.16½	@	
Cut		.18½	@	
LONSDALE				
White, piece		.48	@	
cut		.60	@	
Colors, piece		.51	@	
cut		.64	@	
Green and blue, piece		.56	@	
cut		.70	@	
NAINSOOKS				
White		.18	@	.21½
Flesh		.22	@	
RAINCOAT FABRICS				
COTTON				
Bombazine 64 x 60	*yard*	.10¾	@	
60 x 48		.09⅞	@	
Cashmeres, cotton and wool, 36-inch, tan		.60	@	
Twills 64 x 72		.10	@	.12
60 x 102		.14	@	
Twill, mercerized, 36-inch, blue and black		.26½	@	
tan and olive		.24	@	
Tweed		.40	@	1.00
printed		.18	@	
Plaids 60 x 48		.10½	@	
56 x 44		.09½	@	
Repp		.24	@	
Prints 60 x 48		.12	@	
64 x 60		.13	@	

IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING—PLAIN AND FANCIES		
63-inch, 3¼ to 7½ ounces	yard	@
36-inch, 2¾ to 5 ounces		@
IMPORTED PLAID LINING (UNION AND COTTON)		
63-inch, 3½ to 7 ounces	yard	@
36-inch, 2 to 4 ounces		@
SHEETINGS, 40-INCH		
48 x 48, 2.50-yard		$0.10¼ @
48 x 48, 2.85-yard		.09½ @
64 x 68, 3.15-yard		.10¾ @
56 x 60, 3.60-yard		.09½ @
48 x 44, 3.75-yard		.08 @
SILKS		
Canton, 38-inch	yard	.27½ @
Schappe, 36-inch		.45 @
STOCKINETTES		
SINGLE THREAD		
3½ Peeler, carded	pound	@
4½ Peeler, carded		@
6½ Peeler, combed		@
DOUBLE THREAD		
Zero Peeler, carded	pound	@
3½ Peeler, carded		@
6½ Peeler, combed		@
TIRE FABRICS		
BUILDING		
17¼-ounce Sakellarides, combed	pound	.90 @
17¼-ounce Egyptian, combed		.70 @
17¼-ounce Egyptian, carded		.65 @
17¼-ounce Peelers, combed		.70 @
17¼-ounce Peelers, carded		.52 @
CORD		
15-ounce Egyptian	pound	.76 @
BICYCLE		
8-ounce American	pound	@
10-ounce American		@
CHAFER		
9¼-ounce Sea Island	pound	@
9¼-ounce Egyptian, carded		.80 @
9¼-ounce Peeler, carded		.67 @

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS

NEW YORK

In most lines of pigments and compounding ingredients a tendency to steady increase in demand has been noted during the past month. The chief price changes were reductions of ½ and ¼-cent a pound on lead oxides. The effect of these reductions in stimulating demand on the part of consumers will not react on production for at least a month.

ANILINE OIL. There is an excessive supply of this material and the call is purely routine. Prices range from 18 to 26 cents a pound.

BARYTES. Business in this material during most of August has been steady but sub-normal, some improvement being noted in the latter part of the month. There is little barytes of foreign origin on the market.

BENZOL. The demand on the short supply continues abnormal. Foreign business is large but shipments are hampered owing to lack of transport facilities. The short supply will not be remedied until the steel industry renews operation of coke making from which benzol is a by-product.

BLANC FIXE. The market is quiet and business light.

CADMIUM SULPHIDE. Remains steady at $1.20 a pound.

CARBON BISULPHIDE. Supplies are abundant and prices range from 6 to 7½ cents a pound.

CARBON TETRACHLORIDE. There has been a well-sustained demand and ample stocks. Prices have held firm at 10½ to 12 cents a pound.

CHINA CLAY. Liberal imports arrived early in the month. There is now a good stock in the market and a fair call.

DRY COLORS. Activity has not been marked. The end of price reductions has been reached and the outlook is reported as encouraging.

GAS BLACK. The tire manufacturing demand continues to improve with the steadily increasing output of tires.

HEXAMETHYLENE TETRAMINE. Prices have dropped well below the dollar mark. Plenty of stock is available at 83 to 85 cents a pound with inquiries limited. Latterly supplies were reported at 80 cents.

LITHARGE. There has been no marked increase of interest among consumers since the price reduction became effective. The drop in price was ¾ cents below the rate ruling for several months previously. The price now fixed is 7½ to 7¾ cents.

LITHOPONE. The demand holds steady and of good volume. Price 6 to 6½ cents a pound in bags. One of the largest producers has doubled its capacity within recent weeks owing to the extending use of lithopone for outside painting as well as for tires.

SOLVENT NAPHTHA. Routine business is reported with prices rather weak.

SUBLIMED LEAD. In this line the reduction in price was set at ½-cent a pound. Some increase of demand followed; and more will follow as the mechanical rubber goods industry gathers headway in the expected revival of business.

SULPHUR. Demand is reported rather sluggish and prices unchanged.

TALC. The call for domestic and foreign grades is steady and prices unchanged.

WHITING. Consumption fair, and supplies ample to take care of any business that may reasonably be expected.

ZINC OXIDE. There is a steadily increasing demand from the tire manufacturers, which, it is anticipated, will continue for some time as the factories regain normal production.

NEW YORK QUOTATIONS

August 23, 1921

Prices subject to change without notice

ACCELERATORS, ORGANIC				
Accelerene (f. o. b. English port)	lb.	13s.	@	
Accelemal (bbl.)	lb.	$0.60	@	
Adco	lb.	.75	@	
Aldehyde ammonia crystals	lb.	.95	@	1.00
Aniline oil (drums extra)	lb.	.20	@	
Excellerex	lb.		@	
Formaldehyde aniline	lb.	.55	@	.60
Hexamethylene tetramine	lb.	.85	@	.90
Lead oleate (400 lb. bbls. factory)	lb.	.20	@	
N. C. C.	lb.		@	
No. 999	lb.	.14	@	
Paradin	lb.	.59	@	
Paraphenylene diamine	lb.		@	
Thiocarbanilide	lb.		@	
Vulcocene	lb.		@	
X L O	lb.	2.00	@	
ACCELERATORS, INORGANIC				
Lead, dry red	lb.	.10	@	
sublimed blue	lb.	.07¼	@	.07½
sublimed white	lb.	.07¼	@	
white, basic carbonate	lb.	.07½	@	.08
Lime, flour	lb.	.02½	@	
Litharge, domestic	lb.	.07½	@	.07¾
imported	lb.	.17	@	
sublimed	lb.		@	
Magnesium, carbonate, light	lb.	.07½	@	.10
calcined light	lb.	.27	@	.30
extra light	lb.	.50	@	
medium light	lb.	.25	@	
calcined heavy (bbl.)	lb.	.06	@	.07
ACIDS				
Acetic 28 per cent	lb.	.02½	@	
glacial, 99 per cent	lb.	.11½	@	
Cresylic (97% straw color, drums)	gal.	.80	@	
(95% dark, drums)	gal.	.75	@	
Muriatic, 20 degrees	lb.	.02	@	
Nitric, 36 degrees	lb.	.05¾	@	
Sulphuric, 66 degrees	lb.	.01½	@	
ALKALIES				
Caustic soda	lb.	.03¾	@	.04
Soda ash, 58%	cwt.	1.90	@	2.25
COLORS				
Black				
Bone, powdered	lb.	.06½	@	.08¼
Carbon black (sacks, factory)	lb.	.10½	@	.20
pressed	lb.		@	

COLORS—Continued

Dipped goods	lb.	$1.00	@	
Drop	lb.	.07	@	.16
Ivory black	lb.	.15	@	.45
Lampblack	lb.	.15	@	
Micronex	lb.	.12	@	.15
Oil soluble aniline	lb.	.95	@	
Rubber black	lb.	.10	@	.16
Rubber makers' non-flying black	lb.	.40	@	
Blue				
Cobalt	lb.	.25	@	.30
Dipped goods	lb.	1.00	@	
Prussian	lb.	.50	@	
Rubber makers' blue	lb.	3.50	@	
Ultramarine	lb.	.16	@	.35
Brown				
Iron oxide	lb.	.04	@	.06
Sienna, Italian, raw and burnt	lb.	.06½	@	.12½
Sienna, Italian, raw (tan color)	lb.	.07	@	.15
Umber, Turkey, raw and burnt	lb.	.05½	@	.06½
Vandyke	lb.	.05	@	.08
Green				
Chrome, light	lb.	.32	@	.34
medium	lb.	.34	@	.39
dark	lb.	.43	@	.47
commercial	lb.	.12	@	
tile	lb.	.15	@	
Guignet	lb.	1.50	@	
Dipped goods	lb.	1.00	@	
Oxide of chromium	lb.	.55	@	
Rubber makers' green	lb.	3.50	@	
Red				
Antimony, crimson	lb.	.40	@	.51
crimson, E. 15/17% (bbls.)	lb.	.48	@	
crimson, F	lb.	.35	@	
crimson, R. M. P	lb.	.55	@	
Antimony, golden	lb.	.21	@	.27
golden, R. M. F	lb.	.25	@	
golden 1	lb.	.30	@	
golden 2	lb.	.25	@	
golden, E. 15/17% (bbls.)	lb.	.25	@	
7-A	lb.	.42	@	
vermilion	lb.	.50	@	
red sulphuret	lb.	.25	@	
Arsenic, red sulphide	lb.	.12	@	
Dipped goods, red	lb.	1.00	@	
purple	lb.	1.00	@	
orange	lb.	1.00	@	
Indian	lb.	.12	@	
Iron oxide, reduced grades	lb.	.03	@	.13
pure bright	lb.	.14	@	
Maroon oxide	lb.	.12	@	
Oil soluble aniline, red	lb.	1.75	@	2.00
orange	lb.	1.50	@	
Oximony	lb.	.16	@	
Para toner	lb.	1.40	@	
Red excelsior	lb.		@	
Rubber-makers' red (four shades)	lb.	3.50	@	
purple	lb.	2.50	@	
Spanish natural	lb.	.04½	@	.05
Toluidine toner	lb.	2.75	@	3.25
Venetian	lb.	.02½	@	.05
Vermilion, American	lb.	.25	@	.30
permanent	lb.	.30	@	
English quicksilver	lb.	.90	@	1.00
White				
Albalith	lb.	.06	@	.06½
Aluminum bronze	lb.	.60	@	.65
Lithopone, Beckton white	lb.	.06	@	.06½
Lithopone, domestic (factory)	lb.	.06	@	.06½
Ponolith (carloads, factory)	lb.		@	
Rubber-makers' white	lb.		@	

Zinc oxide. American Horse Head (factory)	C.L. lb.	@	L.C.L. lb.
	.08¾	@	.09¾
Special	.08	@	.08½
XX red	.07½	@	.08
French process, Florence brand factory:			
White seal	.11	@	.11¼
Green seal	.09¾	@	.10¼
Red seal	.08¾	@	.09¼
White seal	.11	@	11¼
Azo (factory):			
ZZZ (lead free)	.07½	@	.08
ZZ (under 5% leaded)	.07¼	@	.07¾
Z (8-10% leaded)	.07	@	.07½

Yellow				
Arsenic, yellow sulphide	lb.	.70	@	
Cadmium, sulphide	lb.	1.50	@	1.35
Chrome, light and medium	lb.	.21	@	
C. P.	lb.	.21	@	
Dipped goods	lb.	1.00	@	
Ochre, domestic	lb.	.02½	@	.03½
imported	lb.	.04	@	.04½
Oil soluble aniline	lb.	1.60	@	
Rubber makers' yellow	lb.	3.50	@	
Zinc chromate	lb.	.35	@	

COMPOUNDING INGREDIENTS

Aluminum flake (carloads)	ton	25.00	@	35.00
hydrate, light	lb.	.22	@	.25
Ammonium carbonate (lump)	lb.	.07½	@	.10
Asbestine	ton	20.00	@	25.00
Barium, carbonate precipitated	ton	85.00	@	
dust	ton	100.00	@	
Barytes, pure white (carloads)	ton	23.90	@	
off color (carloads)	ton	20.00	@	
uniform floated (carloads)	ton	23.90	@	
Basofor	lb.	$0.64½	@	
Beta-naphthol	lb.	.33	@	
Blanc fixe	lb.	.04	@	
Bone ash	lb.		@	
Carrara filler (factory)	ton	20.00	@	
Chalk, precipitated, extra light (f. o. b. factory)	lb.	.03½	@	.04¼
heavy (f. o. b. factory)	lb.	.02½	@	.03¼
China, clay, Dixie	ton	22.00	@	35.00
Blue Ridge	ton	22.00	@	35.00
domestic	ton	7.50	@	9.00
imported	ton	16.00	@	24.00
Cotton linters, clean mill run (factory)	lb.	.02½	@	
Diatomite	lb.	.03	@	.04
Fossil flour (powdered)	ton	60.00	@	
(bolted)	ton	65.00	@	
Glue, high grade	lb.	.25	@	.35
medium	lb.	.17	@	.24
low grade	lb.	.10½	@	.16
Graphite, flake (400-pounds bbl.)	lb.	.10	@	
amorphous	lb.	.05	@	
Ground glass FF. (bbls.)	lb.		@	
Infusorial earth (powdered)	ton	60.00	@	
(bolted)	ton	65.00	@	
Liquid rubber	lb.	.15	@	
Mica, powdered	lb.	.15	@	
Phenanthrene	lb.		@	
Pumice stone, powdered (bbl.)	lb.	.03	@	.08
Rotten stone, powdered	lb.	.02½	@	.04½
Rubber paste	lb.		@	
Silica, aluminum	ton	25.00	@	30.00
gold bond	ton	35.00	@	
silver bond	ton	25.00	@	
Soap bark, powdered	lb.	.23	@	
Soapstone, powdered-gray (carloads)	ton	12.00	@	
Starch, powdered corn (bags)	cwt.	2.33	@	
(bbls.)	cwt.	2.61	@	
Talc, powdered soapstone	ton	20.00	@	
Terra blanche	ton	25.00	@	28.00
Tripoli flour, air-floated, cream or rose (factory)	ton	25.00	@	
white (factory)	ton	27.00	@	
Tyre-lith	ton	90.00	@	
Whiting, Alba	cwt.	15.00	@	18.00
Columbia	cwt.		@	
commercial	cwt.	1.10	@	1.20
Danish	ton	20.00	@	
English cliffstone	cwt.	1.70	@	1.90
gilders	cwt.	1.20	@	1.35
Paris, white, American	ton	35.00	@	
Quaker	ton	13.00	@	15.00
Superfine	ton	15.00	@	17.00
Wood pulp, imported	ton		@	
XXX	ton	35.00	@	
X	ton	30.00	@	
Wood flour	ton	35.00	@	40.00

MINERAL RUBBER

Elateron (c. l. factory)	ton		@	
(l. c. l. factory)	ton		@	
Gilsonite	ton	70.00	@	
Genasco (c. l. factory)	ton	50.00	@	
(l. c. l. factory)	ton	52.00	@	
Hard hydrocarbon	ton	35.00	@	45.00
Soft hydrocarbon	ton	35.00	@	40.00
320 M. P. hydrocarbon (c. l. factory)	ton	50.00	@	55.00
(l. c. l. factory)	ton	57.50	@	
300/310 M. P. hydrocarbon (c. l. factory)	ton	40.00	@	
(l. c. l. factory)	ton	45.00	@	
M. R. X	ton		@	
Pioneer, M. R. (c. l. factory)	ton	46.00	@	
(l. c. l. factory)	ton	48.00	@	
Raven M. R.	ton		@	
Robertson, M. R. pulverized (c. l. factory)	ton		@	
M. R. pulverized (l. c. l. factory)	ton		@	
M. R. (c. l. factory)	ton	52.50	@	
M. R. (l. c. l. factory)	ton	55.00	@	
Rubrax (factory)	ton	50.00	@	
States "A" (c. l. factory)	ton	45.00	@	
No. 1 (c. l. factory)	ton	40.00	@	
Synpro, granulated, M. R. (factory)	ton	69.50	@	

OILS

Avoilas compound ((bbl.)	lb.	.14	@	
(kegs)	lb.	.18	@	
Castor, No. 1, U. S. P.	lb.	.11½	@	
No. 3, U. S. P.	lb.	.10¼	@	
Corn	lb.	.10	@	
refined	lb.		@	
Cotton	lb.	.09	@	
Glycerine (98 per cent)	lb.	.14½	@	.15
Halowax	gal.	.25	@	.27
Linseed, raw	gal.	.80	@	
Linseed compound	gal.		@	
Palmoline	lb.		@	
Palm niger	lb.	.07	@	
Peanut	lb.	.10	@	
Petrolatum, standard	lb.	.04	@	.08
Petrolatum, sticky	lb.	.08	@	.10
Pine, steam distilled	gal.	1.30	@	
Rapeseed, refined	lb.	.12½	@	
blown	lb.	.13½	@	
Rosin	gal.	.41	@	
Synpro	gal.	.35	@	.60
Soya bean	lb.	.08¾	@	
Tar	gal.	.35	@	

RESINS AND PITCHES

Cantella gum	lb.	$0.50	@	
Cumar resin, hard	lb.	.09	@	.13
soft	lb.	.09	@	.13
Tar, retort	bbl.	11.75	@	12.25
kiln	bbl.	11.50	@	
pine retort	bbl.	14.00	@	
Pitch, Burgundy	lb.	.05	@	.05¼
coal tar	ton	20.00	@	
pine tar	lb.	.03½	@	
ponto	lb.	.10	@	
Rosin, K (bbl.)	280 lbs.	5.85	@	
strained (bbls.)	280 lbs.	5.35	@	
Shellac, fine orange	lb.	.90	@	

SOLVENTS

Acetone (98.99 per cent drums [6.62 lbs. per gal.])	lb.	.12½	@	.13½
Benzol (90%, drums [7.21 lbs. per gal.])	gal.	.28	@	.31
pure (drums)	gal.	.30	@	.33
Carbon bisulphide (drums [10.81 lbs. per gal.])	lb.	.06¾	@	.07½
tetrachloride (drums [13.28 lbs. per gal.])	lb.	.11½	@	.12
Paracymene (factory)	gal.	5.00	@	
Motor gasoline (steel bbls.)	gal.	.24	@	
73@76 degrees (steel bbls.)	gal.		@	
68@70 degrees (steel bbls.)	gal.		@	
Naphtha, V. M. & P. (steel bbls.)	gal.	.23	@	
solvent (drums extra)	gal.	.29	@	
Toluol, pure (7.21 lbs. per gal.)	gal.	.28	@	.34
Turpentine, spirits	gal.	.62½	@	
wood	gal.	.59½	@	
Xylol, pure (7.21 lbs. per gal.)	gal.	.40	@	.43
commercial	gal.	.28	@	.35

SUBSTITUTES

Black	lb.	$0.08	@	.14
White	lb.	.09	@	.16
Brown	lb.	.11	@	.15
Brown factice	lb.	.07	@	.15
Rubber factice	lb.	.03¾	@	
White factice	lb.	.08½	@	.17
Paragol, soft and medium	cwt.	6.81	@	
hard	cwt.	6.81	@	

VULCANIZING INGREDIENTS

Lead, black hyposulphite (black hypo)	lb.	.40	@	
Orange mineral, domestic	lb.	.11¾	@	.13½
Sulphur chloride (jugs)	lb.	.20	@	
(drums)	lb.	.08	@	
Sulphur, flour, Brooklyn brand (carloads)	cwt.		@	
Brooklyn brand (less carload)	cwt.		@	
Bergenport brand (bbls.)	cwt.	2.55	@	
(bags)	cwt.	2.30	@	
superfine (carloads, factory)	cwt.		@	

(See also Colors—Antimony.)

WAXES

Wax, beeswax, white, commercial	lb.	.55	@	
ceresine, white	lb.	.14	@	
carnauba	lb.	.16	@	
Montan	lb.	.07	@	
ozokerite, black	lb.	.30	@	
green	lb.	.30	@	
paraffin	lb.	.03½	@	.08
sweet wax	lb.	.12	@	

OCEAN RATES FROM NEW YORK ON TIRES, TUBES, MECHANICAL GOODS, CLOTHING, FOOTWEAR AND DRUGGISTS' SUNDRIES[1]

(Same rates apply from other Atlantic ports where service is available.)

Country and Port	Rates Cu. Ft.	Rates 100 lbs.
AFRICA		
AFRICA, EAST COAST—		
Beira	..	*$26.00
Plus landing charges $0.30 per ton.		
Kilendini	..	*30.40
Delagoa Bay, Lourence Marques	..	*25.40
Mauritius	..	*31.00
NORTH COAST—		
All ports	..	*22.00
EGYPT—		
Alexandria	..	*22.00
SOUTH COAST—		
Algoa Bay	..	*23.60
Capetown	..	*23.00
East London	..	*24.20
Port Natal	..	*24.80
WEST COAST—		
Accra-Lagos, Secondi, Buruttu	..	*30.00
Dakar, Freetown	..	*28.00
Boma, Matadi	..	*32.00
ASIA		
CHINA—		
Hongkong, Shanghai	..	*23.00
INDIA—		
All direct ports	..	*21.00
Madras, Rangoon	..	*23.00
JAPAN—		
All direct ports	..	*23.00
JAVA—		
All ports	..	*21.00
MANCHURIA—		
Dalny	..	*24.00
PHILIPPINES—		
Manila	..	*23.00
STRAITS SETTLEMENTS—		
Singapore, Penang	..	*21.00
SYRIA—		
Beyrout	..	*24.00
CENTRAL AMERICA		
COSTA RICA—		
Port Limon	$.64	1.31
MEXICO—		
Tampico	.52½	1.05
Plus 2½c. per 100 lbs. bar dues.		
Vera Cruz, Puerto Mexico	.52½	1.05
Panama—		
Colon	.32	.64
Plus $1 per ton transfer charge.		
Panama	.37	.74
Plus $1 per ton transfer charge.		
SALVADOR—		
La Libertad	.79	1.42
EUROPE		
BELGIUM—		
Antwerp	.40	.75
BRITISH ISLES—		
All ports	.45	.85
Except rubber belting	.50	1.00
CANARY ISLANDS—		
Las Palmas	..	*25.00
DENMARK—		
Copenhagen	.55	1.00
ESTHONIA—		
Reval	.75	1.50
FINLAND—		
Helsingfors	.75	1.50
FRANCE—		
All Atlantic ports	.40	.75
Marseilles	..	*20.00
GERMANY—		
Hamburg, Bremen	.45	.82½
Danzig	.50	.90
GREECE—		
All ports	..	*22.00
HOLLAND—		
Rotterdam	.40	.75
Amsterdam	.40	.75
ITALY—		
Direct ports	.50	1.00
Fiume, Trieste, Venice	..	*26.00
NORWAY—		
All ports	.55	1.00
PORTUGAL—		
Lisbon	..	*20.00
Oporto	..	*25.00
RUMANIA—		
All ports	..	*25.00
SPAIN—		
All ports	..	*20.00
Gibraltar	.65	1.20
SWEDEN—		
Malmö, Stockholm	.65	1.25
Gothenburg	.55	1.00
SOUTH AMERICA		
ARGENTINA—		
Buenos Aires	..	*20.00
Rosario	..	*27.50
BRAZIL—		
Rio de Janeiro	..	*22.50
Santos	..	*20.00
Bahia	..	*24.00
Pernambuco	..	*23.50
CHILI—		
All ports	.74	1.32
COLOMBIA—		
Cartagena, Puerto Colombia, Santa Marta	.51	1.12
Plus government charges.		
Buenaventura—		
(via direct steamer)	1.03	1.84
(via transshipment)	.98	1.75
ECUADOR—		
Guayaquil—		
(via direct steamer)	.74	1.32
(via transshipment)	.70	1.25
PERU—		
Callao, Mollendo	.74	1.32
URUGUAY—		
Montevideo	..	*20.00
VENEZUELA—		
La Guayra	.40	.65
Plus 4c per 100 kilos landing charge, plus 40% surcharge.		
NEW ZEALAND—		
All ports	..	*30.00
WEST INDIES		
BERMUDA—		
Hamilton	.37	.75
Grenada, St. Croix, St. Thomas, St. Kitts	.50	1.00
Port of Spain	.40	.75
CUBA—		
Havana	.47	.94
Plus 30c per 100 lbs. Cuban wharfage and handling charges.		
Santiago	.59	1.18
Cienfuegos	.61	1.21
CURAÇAO—		
Curacao	.30	.65
Plus 40% surcharge.		
JAMAICA—		
Kingston	.42	.84
PORTO RICO—		
All ports	.31	.75
San Juan landing charge 1c per ft., or 2½c per 100 lbs. additional.		
SANTO DOMINGO—		
Santo Domingo	.51	.91

[1]Compiled by Austin Baldwin & Co., Inc., foreign freight contractors, 44 Whitehall st., New York, N. Y.

*Rate figured on ton of 40 cubic feet or 2,240 lbs.

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA-PERCHA

Vol. 64 SEPTEMBER 1, 1921 No. 6

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Established 1848.

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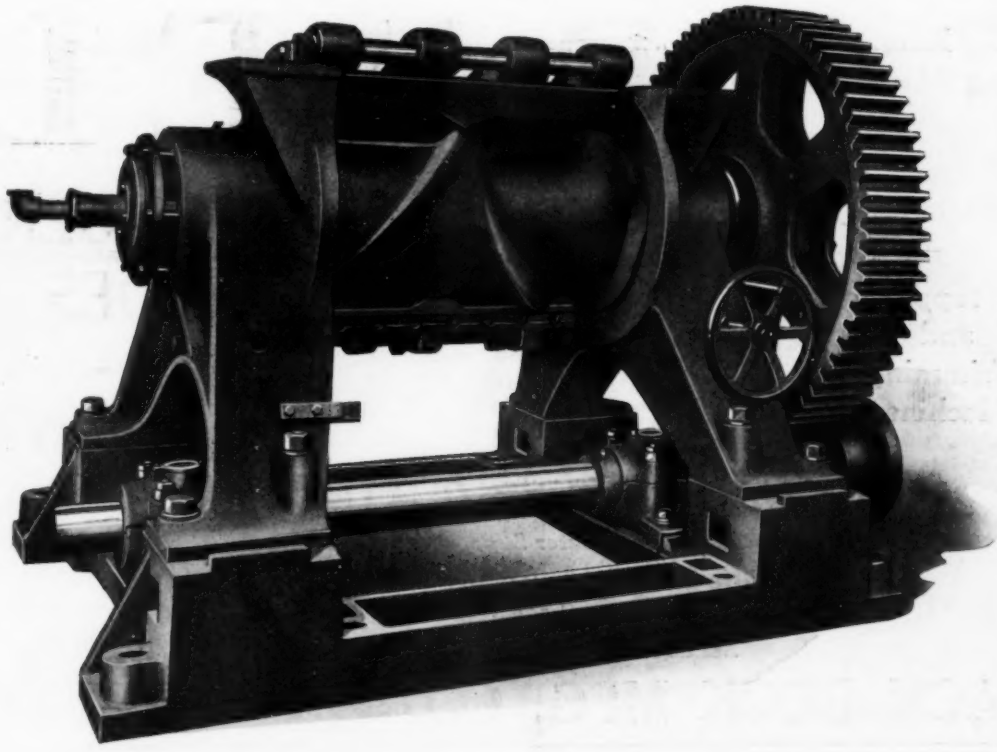

Elementary

THE photograph above shows clearly the elementary principle which is behind the simplicity of design and the sturdy construction of a Farrel masticator. The rubber is masticated and mixed with the compounds by two actions—(1) The batch is pushed back and forth by the blades through the constricted center. (2) The batch is kneaded between the blades and the inside of the cylinder. Both the shell and the rotor are water cooled.

This machine is now and has been for some time giving continuous service in the mixing of rubber for various purposes—saving time and money for the users.

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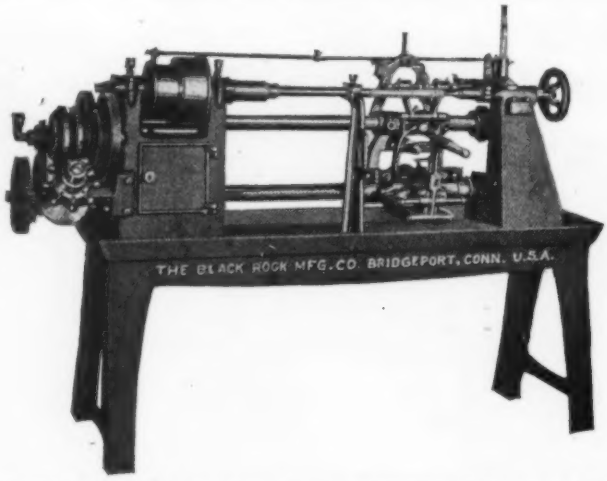

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American Rubber Manufacturers and *Reclaimers*

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Turns out perfect work the first time. No more "second time" jobs. Saves money, material and time. Perfected on the experience gained in equipping thousands of tire factories and tire repair businesses.

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Mechanical ability of our experts is of the highest order.
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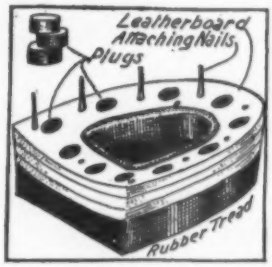

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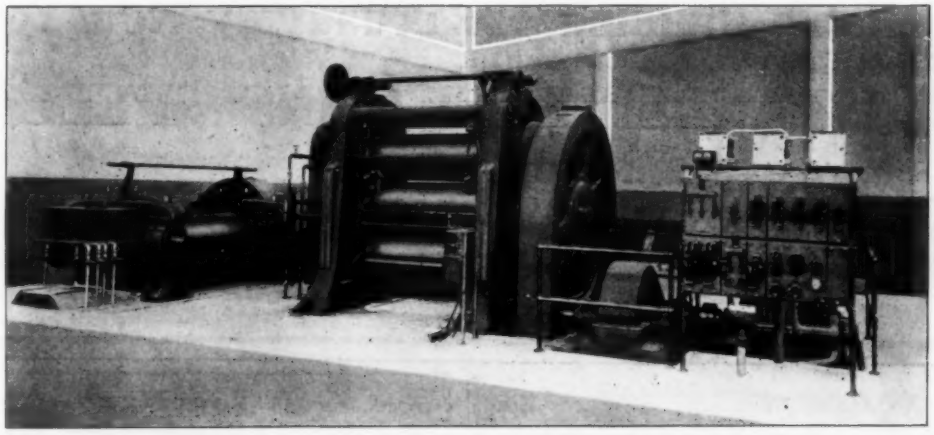

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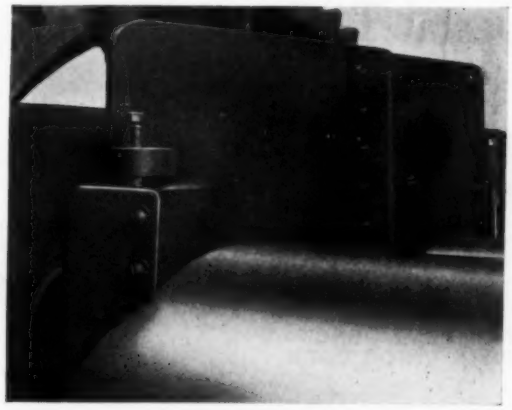
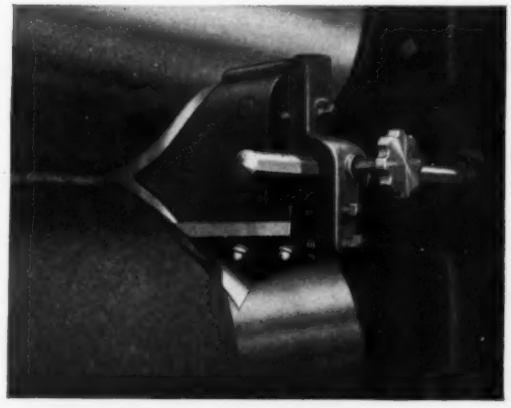


FOR MILLS—*The Guides Are Adjusted Automatically with the Horizontal Movement of the Rolls and They Can Also Be Adjusted Vertically by Simply Loosening the Clamping Screws. Note Also the Adjustable Plow Point Which Prevents the Stock from Spreading Over the Ends of the Rolls, a Feature Found Heretofore Only on "Birmingham" Mill Guides. We Have Equipped Mill Guides with These Plow Points for Many Years.*

FOR CALENDERS—*A Cast Iron Guide with a Bearing Surface of Composition Metal Which Can Be Adjusted Against the Rolls by Set Screws. The Bronze Plow Point, Which Can Be Adjusted Independently, Is Shaped so That the Stock Is Turned Back into the Bank Instead of Spreading Under and Outside the Guides. The Bearing Surface of the Main Guide and That of the Plow Point as Well Is Soft Enough so That It Can Press Against the Rolls without Marring Them and Yet Is Hard Enough to Withstand Considerable Wear.*



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The Non-Skid (fabric) is a remarkably good tire to sell at a competitive price.
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The Fisk Cord cannot be excelled in tire quality or in selling points.
Fisk truck tires, both solid and pneumatic, are business builders.
The Fisk dealer relation is an exceptionally pleasant one.

Fisk branches in 130 cities fill your order over night regardless of where you are located.

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We will cheerfully furnish samples upon request

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Largest Reclaimers in the World

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WITH
65% RUBBER

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Its value to the rubber manufacturer arises from its inertness to acids, alkalies, oxygen and other chemicals.

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"Putting the name across" is never an easy job. People do not make it a point to remember your name when they see it. But if the package is so designed that it will arrest their attention, if it is striking—"different"—they will begin to remember it after seeing it the second or third time. And they will associate your name with your product.

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Any kind of folding box for every kind of business

Look for the Rock-Hill Gray Band on every pair. None genuine without it

ROCK-HILL RUBBER FOOTWEAR

This line has resulted from the application of

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NEW PROCESS
NEW COMPOUND
NEW CONSTRUCTION

The goods have wonderful wear-resisting qualities.

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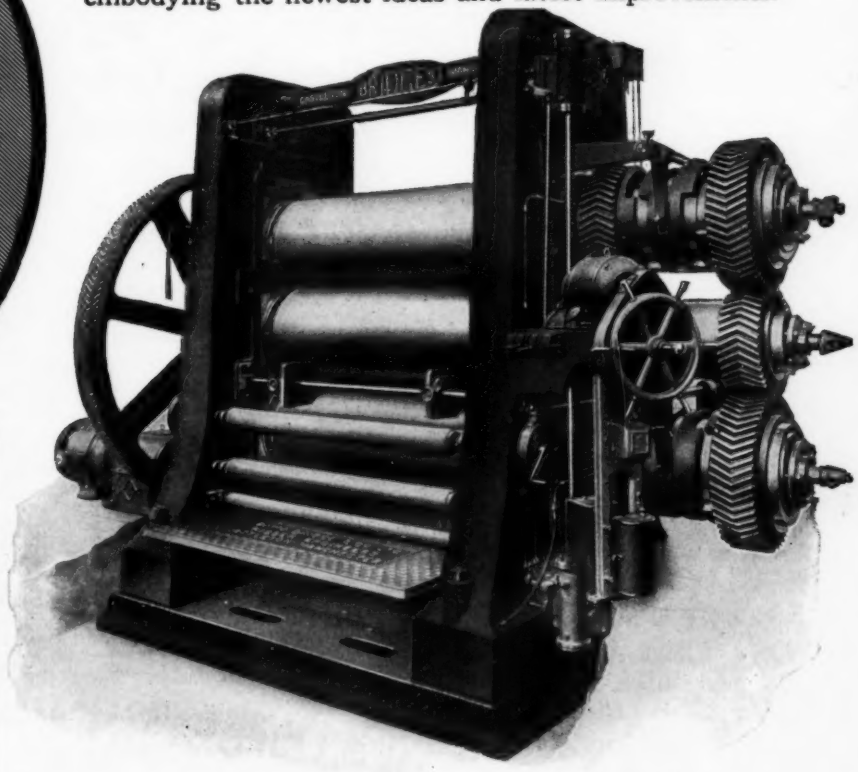
Always abreast—or a little ahead—of current practice embodying the newest ideas and latest improvements.



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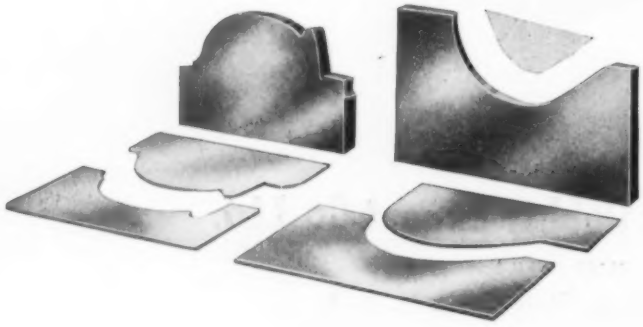

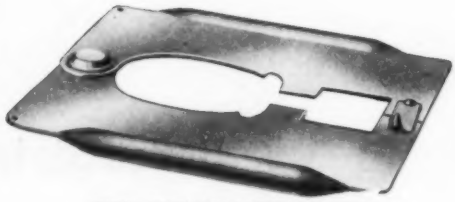

TIRE BUILDING TEMPLATE

NECESSITY FOR CONTROL OF MASTER TEMPLATES

Every tire manufacturer should control his own master templates of each mold, core or other equipment, also at least one set of working templates for checking purposes.

He can hardly maintain the accuracy and uniformity of his equipment unless he does so, regardless of whether he makes his own molds or buys them.

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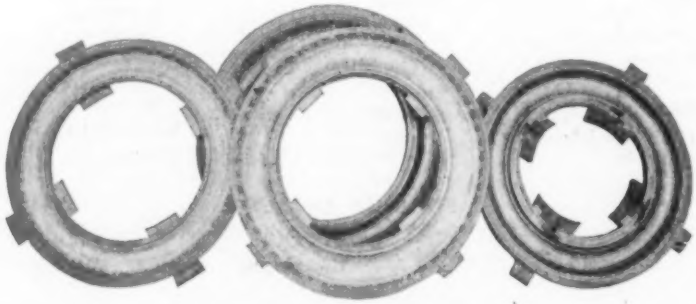
Tool and template work is an important part of our business, but we want you to remember that we operate a large and well-equipped shop turning out molds, plain and non-skid; cores, solid and collapsible; also tire-vulcanizing presses for tiremakers who demand good work.

It will pay you to have your templates made by practical mold and core people.

We will cheerfully submit quotations on tool and template work as well as on complete lines of molds and cores upon receipt of your specifications.



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There Is No MR Better Than RMR

Manufacturers of successful rubber products are thoroughly appreciative of the value and importance of good mineral rubber as a compounding ingredient.

It is universally recognized that high-quality MR contributes materially to the lowering of production costs and to the efficiency of manufacturing processes. The beneficial effect of MR on finished rubber products has been proven beyond doubt. Its adaptability to the requirements of practically every type of rubber compound has been amply demonstrated.

The question in the mind of the manufacturer is not, "Shall I use MR in my compound?" but rather "Which MR shall I use?"

Manufacturers who have used Robertson Process Mineral Rubber have settled this question once and for all. They are convinced that there can be no MR better than RMR, for in this versatile Robertson Product they have found all the essential characteristics of a perfect mineral rubber.

RMR is always uniform in quality and composition. It always conforms strictly to specifications. Hence, it does away with all necessity for costly and troublesome readjustments of rubber-compounding formulae.

Absolute purity is another outstanding feature of RMR which manufacturers of high-grade rubber products particularly appreciate. RMR actually analyzes 99.5+% pure. It is made from the best raw materials obtainable and is free from grit or any foreign matter.

RMR is noted for its remarkable adaptability. It combines readily with crude rubber. It blends easily and perfectly with all rubber compounding ingredients. Used in any rubber compound it produces a denser, better finished mix; shortens the time required for curing and increases the plasticity, elasticity, tensile strength and aging qualities of the finished rubber material.

H. H. ROBERTSON COMPANY, Pittsburgh, Pa.

Robertson Process Mineral Rubber is produced in solid and pulverized form to meet all requirements. Special specifications can be developed to meet special needs. Orders for any quantities can be quickly executed. Prompt shipment is assured. Samples, prices and descriptive literature will gladly be sent upon request.

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Single and Double Acting Force and Lift, Hand, Windmill, Tank and Hydro-Pneumatic Pumps — Electric House Pumps and Direct Water Systems — Self-Oiling Bulldozer Power Pumps and Working Heads — Cylinders and Power Working Barrels—Spray Pumps and Accessories Pipe and Well Fittings.

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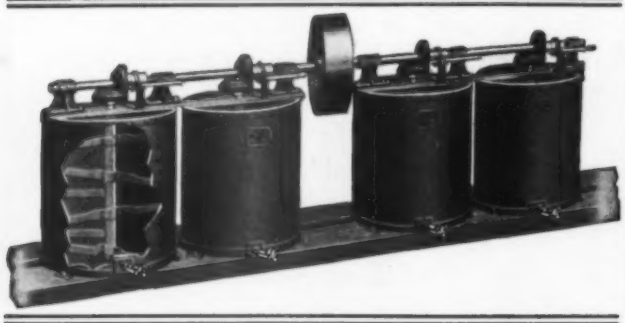
ASHLAND PUMP & HAY TOOL WORKS
ASHLAND ESTABLISHED 1870 OHIO

"Day" Paragon Cement Mixers

Capacity 25—1,000 Gallons
Built Singly or in Gangs



Write for catalogue of "Day" Hero-mixers, Imperial Mixers and other rubber solution mixers.

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Waterproofed, Rubberized and Combined COATED FABRICS

QUALITY AF Co

Single and Double Texture for Automobile Tops, Raincoats, Etc.

Centrally Located for Middle West Shipments

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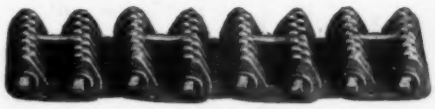
THE MORSE "ROCKER JOINT"

FOR ALL TYPES OF POWER TRANSMISSION

Morse Silent Chains deliver full power with minimum friction, require minimum floor space, are economical to maintain and durable.

Investigated, endorsed, installed by Engineers and Industrial Leaders of all nations as the World's most efficient (99%) Power Transmission.

99%



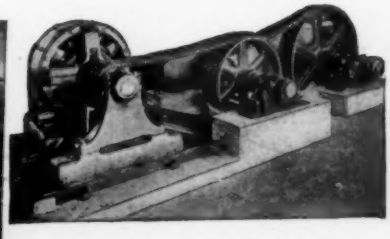
Efficient
Oil Baths not required

MORSE Silent Chain Drive has attained its leading position by results.

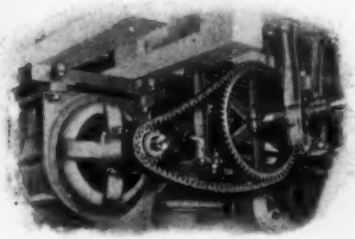
The Cost of Application Is Not Excessive.

The Return on the Investment Is a Large One.

600 H.P. Hot Rolling Mill. Morse Silent Chain Drive. In service five years, St. Louis Screw Co.



125 H.P. Morse Silent Chain Drive to Reversing Sheet Lead Rolls.
Reverses Direction every 45 seconds.
Motor to counter; Chain 13" wide, 120" centers.
Counter to Rolls; Chain, 16" wide, 120" centers.



Thirty H.P. Morse Silent Chain Drive to Lineshaft. American Tool Works Co., Cincinnati, O. Over one hundred Drives of various H.P. in this plant.

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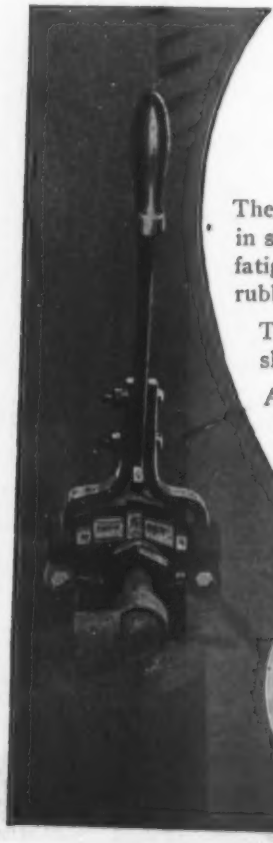

Small in Size
Easy to Operate

The Yarway Hydraulic Valve (Caskey Patents) is small in size and can be operated with greater ease and with less fatigue than larger valves. For this reason it is used in many rubber plants.

The lever is short and travels through a 90 degree arc, a very slight movement bringing instant response.

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And it stands up in service as well as, or even better than, the most expensive valves.

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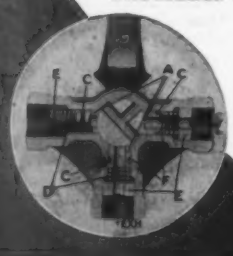

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A—Extra long, special soft bronze sealing bushings.
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D—Held tight against plug by this spring.
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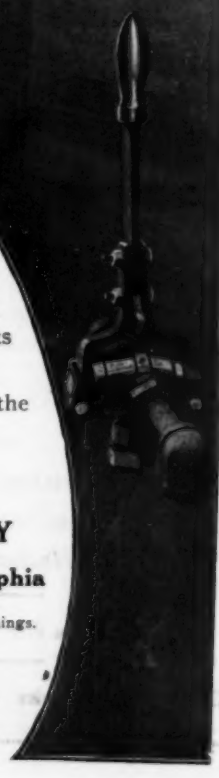
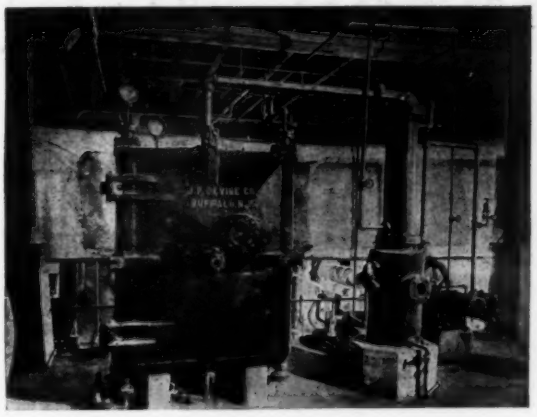
F—Vents for admitting pressure behind C.
Rotary part of valve self-grinding on A.





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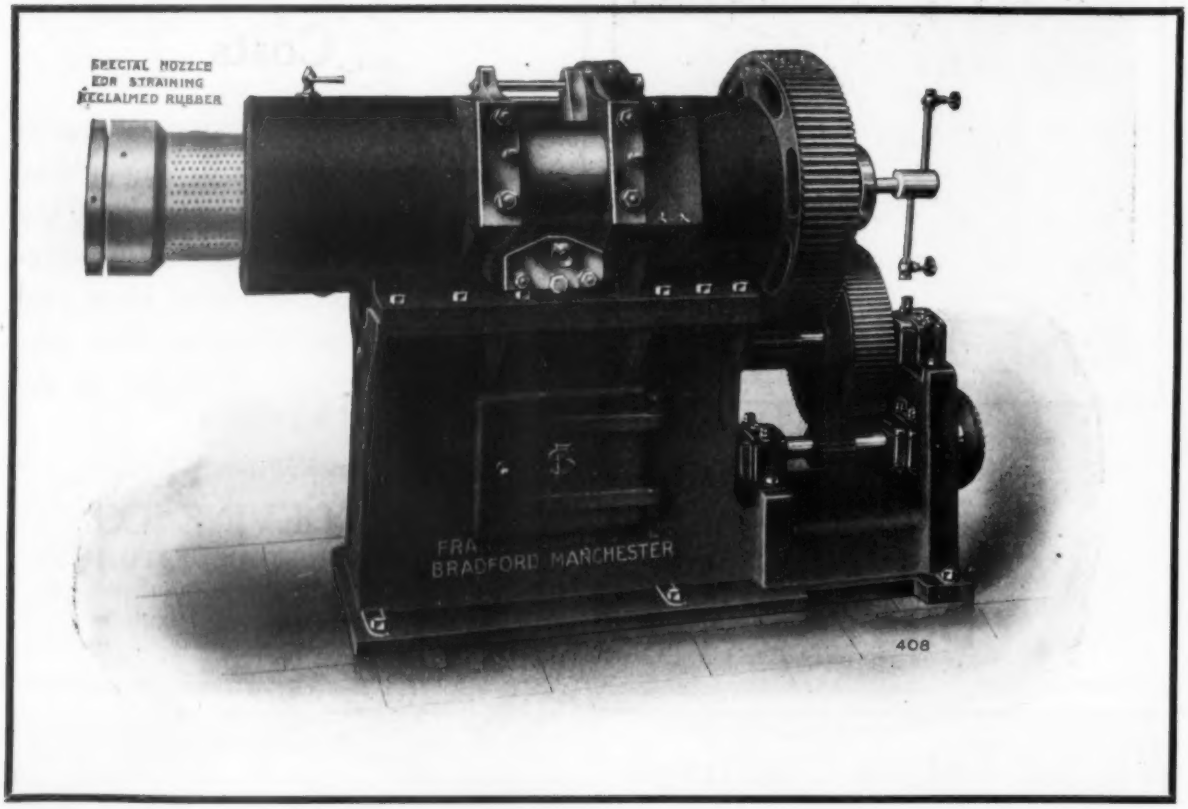

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THIS machine is fitted with our patent single roller feed and is provided with a special straining nozzle for reclaimed rubber. The machine is arranged for direct motor driving through machine cut gearing.

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Manufacturers and packers of nails for the rubber heel trade. Count absolutely guaranteed. Any style nail, made and packed to your requirements. We are supplying the largest rubber heel plants in the world, and will be pleased to quote you for the coming season.

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which is entirely free of Calcium Sulphate, and can be had with *any* percentage of Free Sulphur required.

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SELF-SEALING, ROLLER BEARING

PATENTED

The economy and efficiency of our new roller bearing quick-closing swing door for Horizontal Vulcanizer is so apparent that we have had a remarkable demand for it, and on every demonstration we have made all of our claims have been verified. Remember, there is no possibility of binding or pinching. One man operates with utmost ease. All bearings are roller or ball type. It swings in half the floor space required by all other hinged doors. We are satisfied when you know this head you will not be without it. We are now in position to furnish all standard sizes promptly. We are in position to furnish also for immediate shipment the lift head type of quick-closing door.

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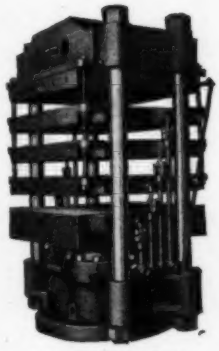
Typical Advantages of Southwark Equipment



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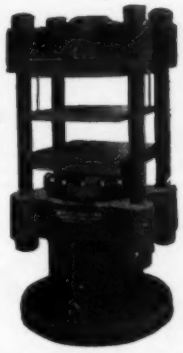
(Four Openings)

Tire Heater Presses. Tension rods take the strain, leaving tank subject only to steam pressure. Thinner shell heats more quickly and consumes less steam. Cooling water entering at top saves time at each cure. Instead of turning heavy top, press is easily and quickly opened by turning latch ring. Placing confined rubber packing around periphery prevents the cover from twisting the packing and pulling it out of place. Outside ram packing prevents flooding of heater during cure. More than 800 now in use.

Steam Platen Press (Four Openings). Because of substantial cylinder base, can be set down on floor anywhere. Babbitt-lined shoes guide platens along substantial columns. Strong, durable, convenient, quick functioning. Furnished with manifolds and slip joints if desired. Liberal drip groove contributes to neatness of curing room.

Steam Platen Press (Steel Platens). Steam ports bored in solid steel plates. Heats and chills more quickly. Platens have smooth, hard surface, for better finishing. Substantial base with drip groove. Occupies small space.



Steam Platen Press
With Steel Platens
(Double and Single Opening)

Tire Forcing Press. The one piece supporting frame, carrying the split babbitted shaft bearings, is bolted to the under sides of the top channels, which receive the strain. This pronounced improvement prevents pump trouble arising from loosened bolts and assures continuously perfect alignment. Write for bulletin which describes many other advantages.

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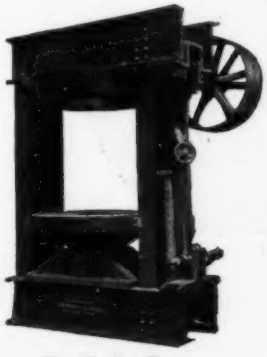

Tire Forcing Press

Immediate Shipment at Low Prices

In our illustrated stock list are given the various sizes of the presses shown here and other items in stock for immediate shipment at prewar prices or lower. You can save money by buying now, even for future use.

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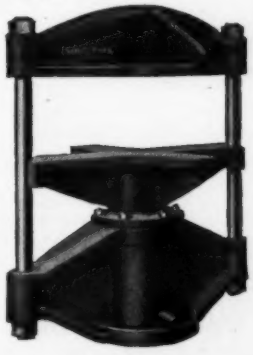

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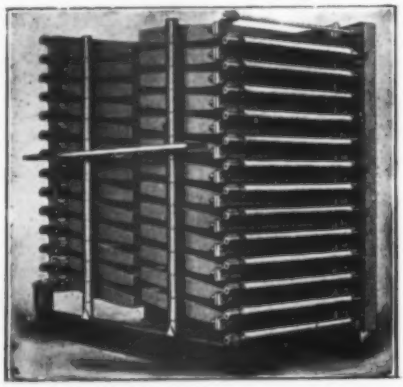

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One side of the Cell Drier is free of obstructions. All threading is done easily and quickly. Almost all the heating surface can be used. There is greater radiation. No waste of fuel or steam, space or time.

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Giant Size

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PATENTED

Can be attached interchangeably to Tire Building Machine or Tire Building Stand

MORE QUICKLY THAN ANY OTHER CORE REQUIRING SELF CENTERING CHUCK

It can be operated in fixed relation to either Tire Stand or Machine.

Tire is removed and Core reset for next operation on all sizes of tires up to five inch by one operator in less than one minute without lifting any Core Sections.

ONE MAN CAN STRIP TIRE and reset CORE on GIANT SIZES IN about SIX MINUTES

Ask for the large list of satisfied customers.

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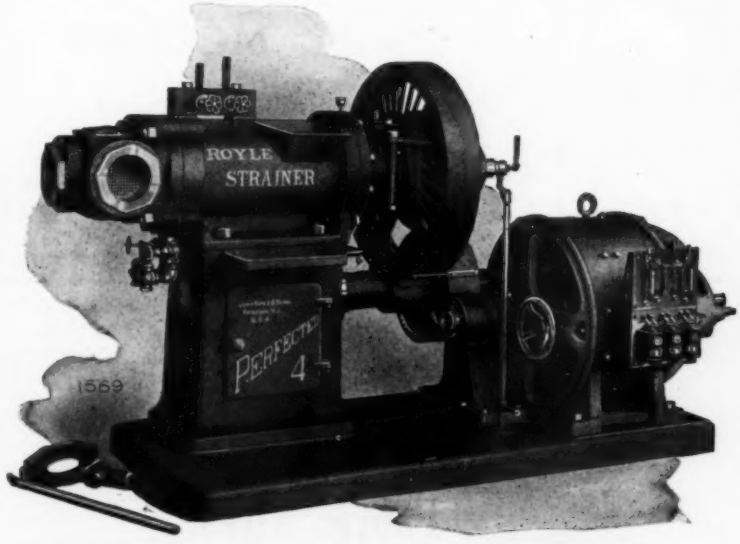

Combines a number of special features for successfully working large masses of compound. Actual tests have shown this Three-Way Strainer to deliver approximately three and one-half times the output from the single delivery type. Time between cleanings has been increased and the renewal of screens can be made very quickly owing to simplified design of holding fixtures.

Descriptive Booklet
No. 281

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Pure Antimony Pentasulphide containing 15-17% free sulphur.

Seven reasons why you should use this product:

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6. It will give a non-blooming stock,—hence the minimum amount of uncombined free sulphur—therefore better aging.
7. It is inexpensive.

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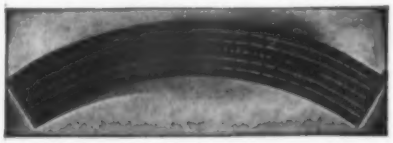

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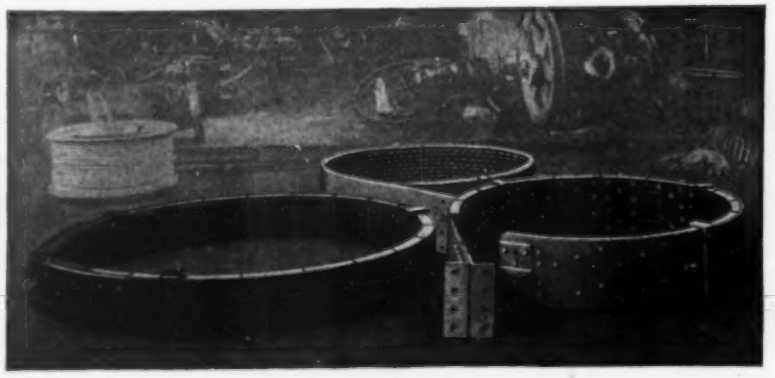

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The materials you get from us are prepared particularly for use in your industry.

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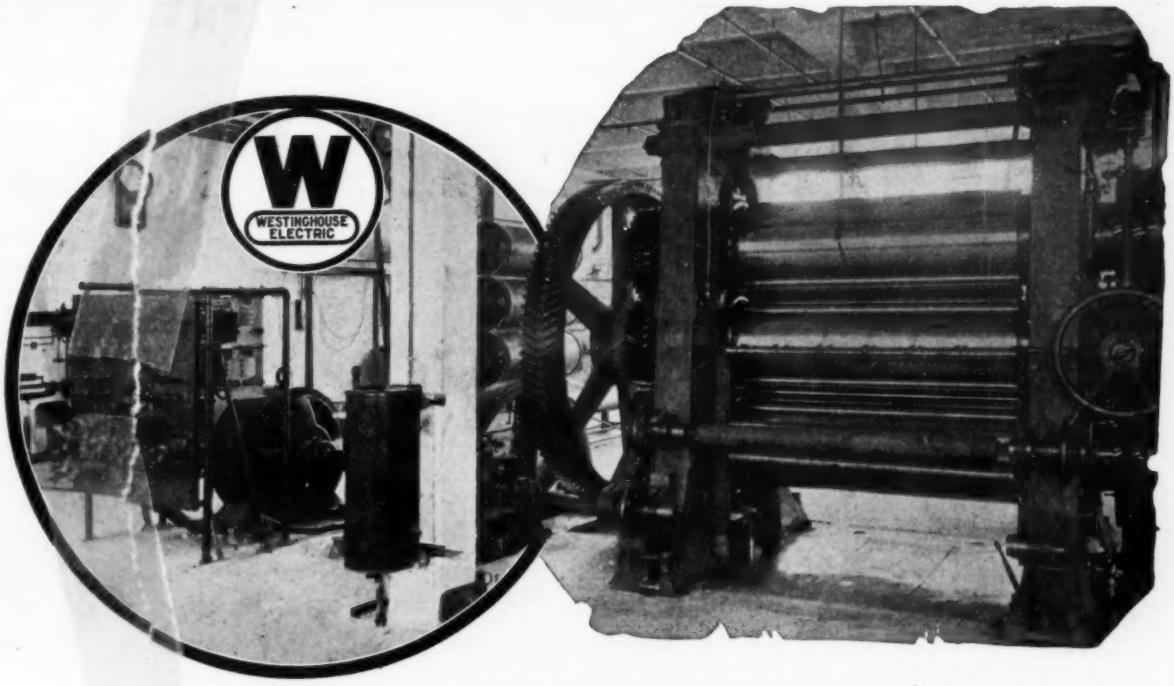

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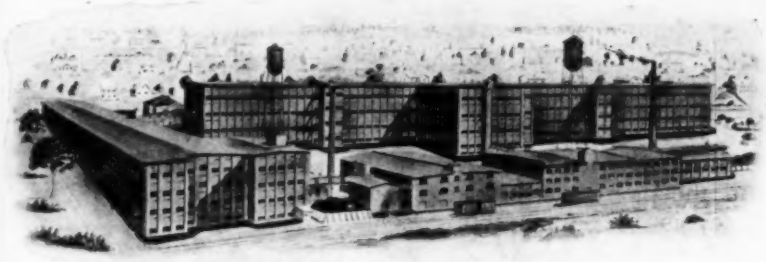

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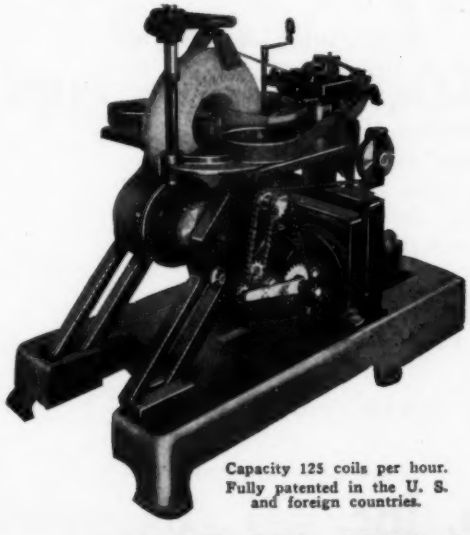

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Under the old methods, the manufacturers' money which should be put into labor, material and factory management is dissipated by competitive selling. After all his efforts and expense the manufacturer finds his dealers are but broken reeds to lean on, for when a competitor comes along with a better discount, or a more silver tongued representative as the case may be, the horse changes color and the painters are busy with a new sign on the dealer's door. Where, then, is the manufacturer's investment in sales promotion?

Owning a minority interest in a chain of stores, as a salesman Culp Incorporated is strongly entrenched. Furthermore he is a salesman who produces demand first, and the factory that employs him as such, in association under the Culp Plan, is rendered a super-selling service at no cost, for this salesman is buying for himself.

Factories, to endure and prosper, must have a permanent, constant and profitable outlet, twelve months a year.

Culp Plan associated stores have a definite demand. This definite associated demand meets associated production at 56 West 45th St., New York, where, in the case of the Culp Plan store owner, Culp Incorporated becomes "purchasing agent extraordinary," and in the case of Culp Plan associated factories, Culp Incorporated becomes "salesman extraordinary."

Culp Plan factory contracts are varied. Some include a minority interest, some include production under "Culp" brands, some include production under factory brand, some include entire production and others "overflow," for just as factories have "overflow" production so do Culp Plan stores have "overflow" demand, hence sales and buying activities of Culp Incorporated are not confined to "Culp" brands alone.

Culp Plan associated factories are pooling their resources for the purpose of meeting the demand created by Culp Plan associated distributors and consumers.

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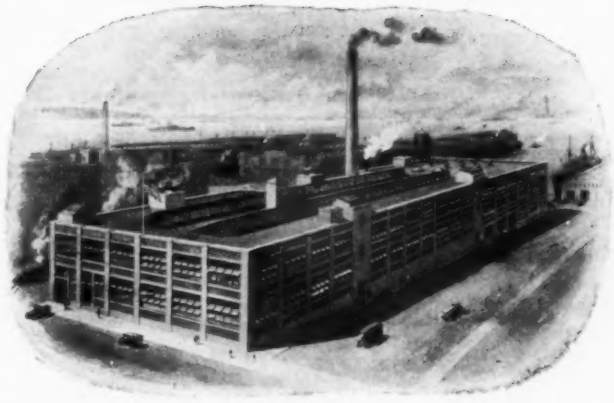

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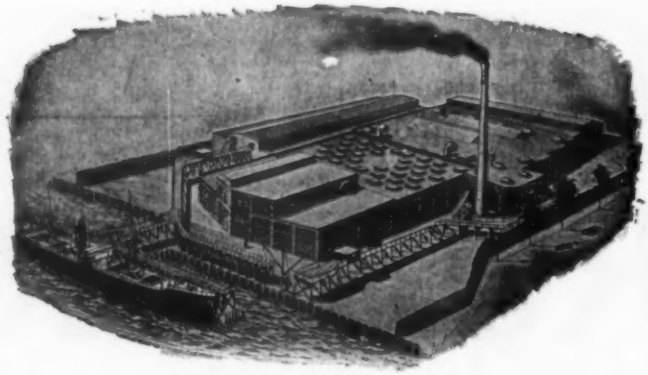

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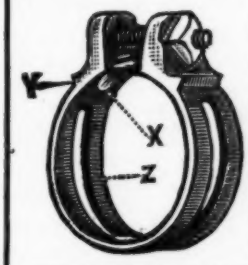

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Our Publicity Page

A DICTIONARY OF THE RUBBER INDUSTRY

EVERY important industry has its own vocabulary—a more or less extensive list of special names and terms, technical, descriptive or indicative. Moreover, familiar words have different meanings in various trades.

Manufacturing industries are becoming exact sciences, and precise definition of the words and terms used is of the utmost importance as a step toward standardization. Upon such definition depend efficiency, cooperation and mutual understanding in the dealings of one branch of an industry with another.

A Long-Felt Need of the Trade

Several of the world's great industries already have their dictionaries. The rubber trade has long needed one of its own, in fact, needed it more than most industries. That there never has been one is probably because of the magnitude of the undertaking, due to the complexity of the subject.

Rubber—A Group of Industries

Rubber manufacture is not a single industry but a remarkably comprehensive group of closely allied industries interwoven with scores of others. It embraces the supply of raw materials such as rubber from plantation and wild sources; chemicals and compounding ingredients from mines and laboratories; fabrics from plantations and mills. It comprises the design and building of special machinery and equipment of many kinds; the preparation of the raw materials for use; the compounding and treatment of the rubber with numerous ingredients; the fabrication and vulcanization of a surprisingly long and varied list of rubber articles; and the shipment and merchandising of the finished goods.

International in Scope

The materials used in the manufacture of rubber goods are gathered from the far quarters of the globe and the finished products are sold throughout the world. Tires, rubber footwear, waterproof clothing, surgical sundries, mechanical goods and insulated wire are used wherever civilization extends. Summed up in a sentence, the rubber business is an international, cosmopolitan industry, in some measure common to every country, and with ramifications running to a greater or lesser degree into business, recreation, and indeed every human endeavor.

Difficulty of Compiling a Glossary

Not only does the complexity of the subject render the preparation of a comprehensive dictionary a considerable undertaking, but few have the time to give it the authoritative character which such a work should have. One may be expert in one branch of the business yet know relatively little of another equally important branch, so highly specialized has the industry become. Keen competition and rapid progress keep those actively engaged in any particular branch so engrossed with the immediate problems of the day that broad vision and general knowledge of the rubber industry as a whole are almost impossible.

Our Editor Undertakes It

The task of compiling an adequate rubber trade glossary has seemed logically an undertaking for the editor of the world's leading rubber trade paper, whose lifelong familiarity with every branch of the rubber industry equips him for the work. The present "Glossary of Words and Terms Used in the Rubber Industry" now running serially in THE INDIA RUBBER WORLD is the realization of a hope long deferred.

Accumulation of Data

Material for it has been accumulating for thirty years, and the work of preparation is now well under way. While the installments published thus far are but a beginning, they indicate the manner in which every term in each department of every branch of the industry is being defined. Eventually they will form the nucleus of an adequate dictionary of the rubber trade.

Our appreciation of the helpful suggestions of the members of the trade in the work of compilation is here expressed.

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Consulting Rubber Engineer
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Especially prepared for Rubber Manufacturers and Reclaimers — Samples will be sent on request

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Crude Rubber, Gutta-Percha and Allied Gums
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Crude Rubber, High Grade Shoddies, Compounding Ingredients

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WADLEIGH COMPANY, LTD. SINGAPORE, S. S.

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68 Broad Street, New York

Brokers and Commission Merchants
CODE ADDRESS: "ALSTED, NEW YORK"
CODES: A B C 5th EDITION, BENTLEY'S

Small Advertisement Department

SITUATIONS WANTED

SALESMAN WHO HAS SPECIALIZED IN DRUGGISTS' SUNDRIES desires to connect with manufacturer who wishes first-class representation in the East or small manufacturer who would consider giving a practical rubber man with first-class credentials and exceptional experience an interest in business. Address Box No. 5488, care of THE INDIA RUBBER WORLD.

MARRIED MAN NOW EMPLOYED WISHES TO MAKE A CHANGE. Eight years' experience in executive capacity with the largest mold and core manufacturers in the country. Practical designer of pneumatic tire equipment. Good reference. Address Box No. 5489, care of THE INDIA RUBBER WORLD.

WANTED: POSITION AS SUPERINTENDENT OR ASSISTANT superintendent with a mechanical rubber concern; also tires and tubes. A good organizer and an A-1 compounder. Address Box No. 5490, care of THE INDIA RUBBER WORLD.

OPEN FOR POSITION: CALENDER AND MILL-ROOM FOREMAN now employed wishes to make change. High-grade, thorough, practical experience on cord and fabric tire stock; capable of organizing department and maintaining maximum production. Invites correspondence from reliable going concerns only. Address M. and C., 26 Fayette St., Binghamton, New York.

FACTORY MANAGER: TECHNICAL GRADUATE, AGE 34, with several years' experience in the manufacture of high-grade auto tires and tubes, desires a new connection with a well-financed firm located in Ohio or the adjacent states. Address Box No. 5000, care of The India Rubber World.

POSITION AS FOREMAN IN MECHANICAL MOLDED GOODS; PRACtical, thorough and a producer; or foreman in molded hose making 500-foot lengths cured in lead tubing; or would combine both. Address Box No. 5404, care of THE INDIA RUBBER WORLD.

FACTORY MANAGER WISHES TO MAKE A NEW CONNECTION. Twenty years' experience with pneumatic tires and inner tubes. Thoroughly practical and up-to-date on compounds, cord tires, air bags, etc. Factory efficiency and operating economy guaranteed. References furnished. Address Box No. 5484, care of THE INDIA RUBBER WORLD.

TIRE CONSTRUCTION ENGINEER AND CHEMIST IS AVAILABLE for position of responsibility. Practical and thorough knowledge of compounding rubbers, textiles, testing and all manufacturing details. As assistant superintendent has produced a high-grade tire and tube. Address Box No 5482, care of THE INDIA RUBBER WORLD.

AVAILABLE FOR POSITION. CHEMICAL ENGINEER AND PRACtical rubber man desires connection. Five years' experience in making chemicals for rubber, compounding, milling and calendering. Thoroughly experienced in tire, tube, and mechanical goods stocks. Address Box No. 5478, care of THE INDIA RUBBER WORLD.

RUBBER HEEL SALES MANAGER CAN BUILD UP A CONSIDERable heel output for an eastern rubber manufacturer desiring to add such a department or increase present output. Address for interview Box No. 5477, care of THE INDIA RUBBER WORLD.

FIRST-CLASS PRODUCTION MANAGER FOR TIRE AND TUBE factory will be available September 15. Fifteen years' experience. Best of references. Address Box No. 5480, care of THE INDIA RUBBER WORLD.

MECHANICAL GOODS SUPERINTENDENT, BROAD EXPERIENCE and practical, for well-established concern having possibilities for future. Address Box No. 5406, care of THE INDIA RUBBER WORLD.

TIRE SUPERINTENDENT; CAN HANDLE ALL MANUFACTURING details for a new business or direct organization of a large factory. Address Box No. 5407, care of THE INDIA RUBBER WORLD.

SITUATIONS WANTED—Continued

PRACTICAL MAN WISHES TO MAKE NEW CONNECTION AS general manager of rubber company. Has had fourteen years' experience in the manufacture of high-grade tires and tubes and can furnish best of references as to capability. Address Box No. 5486, care of THE INDIA RUBBER WORLD.

SUPERINTENDENT NOW EMPLOYED DESIRES TO CONNECT WITH an eastern rubber company in capacity of superintendent or factory manager. Has had twelve years' good practical experience in tire and tube construction, organization and supervisory capacity. Is graduate chemist and capable compounder. Can furnish best of references. Address Box No. 5487, care of THE INDIA RUBBER WORLD.

CHEMIST WITH TWELVE YEARS' EXPERIENCE IN TIRES, TUBES, and mechanical rubber goods, open for engagement. Have held the positions of chief chemist and production manager and am thoroughly familiar with all classes of testing; made all the compounds used in our products and have had active charge of construction and labor. A position with full responsibilities for product and production is desired. Address Box No. 5495, care of THE INDIA RUBBER WORLD.

SALES MANAGER

A highly trained, forceful and experienced foreign and domestic sales manager with proven record and large following is open. I can produce results in spite of present depressed conditions. Remuneration expected in proportion. Highest credentials. Interview solicited. Address Box No. 5496, care of The India Rubber World.

I SPECIALIZE IN THE TRAINING AND DEVELOPMENT OF RUBber factory foremen and inspectors. Analytical method used with great success. Intensive courses given with time-study practice if desired. Practical results assured. Highest references. Correspondence invited. Address Box No. 5473, care of THE INDIA RUBBER WORLD.

COST ACCOUNTANT, FIFTEEN YEARS' EXPERIENCE IN COST accounting with large tire concern, thoroughly experienced in all branches of cost work, several years as departmental manager, would consider connection with concern making from 500 to 1,500 tires per day. Best of references furnished. Moderate salary asked until ability is proven. Address Box No. 5431, care of THE INDIA RUBBER WORLD.

HARD RUBBER PRODUCTION SUPERINTENDENT THOROUGHLY familiar with all phases of hard rubber manufacture, also mechanical lines, desires new connection with reliable concern now manufacturing this line, or planning to do so. Capable of installing new plant, building up organization, handling production. Over ten years' successful experience. For further details, address Box No. 5500, care of THE INDIA RUBBER WORLD.

SUPERINTENDENT OPEN FOR POSITION. THOROUGHLY PRACtical in all departments for manufacturing tires and tubes. Years of experience. A-1 in chemicals and compounds. Address Box No. 5498, care of THE INDIA RUBBER WORLD.

WANTED: POSITION AS TUBE-ROOM FOREMAN. YEARS OF experience. Address Box No. 5497, care of THE INDIA RUBBER WORLD.

SITUATIONS OPEN

WANTED: CALENDER MAN FOR RUNNING THIN PROOFED fabrics and pure gum sheet rubber. State in first letter experience and pay expected. Address Box No. 5485, care of THE INDIA RUBBER WORLD.

WANTED: BY LARGE RUBBER CONCERN, IN VICINITY OF NEW York, a man capable of taking full charge of its tubing department. Address Box No. 5479, care of THE INDIA RUBBER WORLD.

SALESMAN WANTED BY A LARGE CHEMICAL MANUFACTURER to cover the rubber tire trade, preferably a man who has some technical knowledge of the rubber industry, particularly with regard to rubber compounds. Please make application in writing to Box No. 5499, care of THE INDIA RUBBER WORLD.

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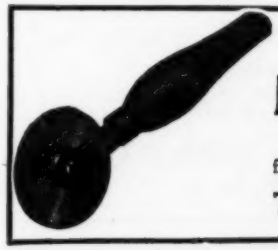

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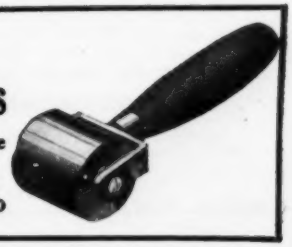

Small Advertisement Department—Continued

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I have been commissioned to dispose of several Rubber Factories, in full activity, in Paris and immediate neighborhood, and in the Provinces. Prices range from 600,000 fr. to 10 million fr.

The rate of exchange being in your favor, this is the time for you to acquire these factories under the most advantageous conditions.

IMPORTANT NOTICE

During the first eight months of 1920 rubber goods to the value of 184,940,000 fr. were imported into France.

This was an average of 23,117,500 fr. per month.
Of this total
100,000,000 fr. came from England.
52,000,000 fr. came from America.
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I AM OPEN TO EQUIP YOUR PLANT WITH THE PROCESS OF manufacturing dress shields, bathing caps, baby pants and bloomers. Arthur C. Squires, 309 Orange street, Newark, New Jersey.

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I have $150,000 worth of rubber machines. I am overloaded, and will sell at one-half the price of new machinery. All sizes of mills, calenders, presses, tubing machines, hydraulic and horizontal vulcanizers, Devine dryers, Birmingham bias cutters and inner tube and tire building machinery. Come and see me and I will sell you.
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FOR SALE—TWO 12 BY 36-INCH MILLS, FINE CONDITION.
Two 150-gallon cement churns.
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Two 12 by 12-inch hydraulic presses.
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One 8 by 12-inch Birmingham washer.
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FOR SALE: 20 BY 20-INCH HYDRAULIC PRESSES.
36 by 36-inch hydraulic presses.
44 by 44-inch hydraulic presses.
30 by 60-inch hydraulic presses.
Royle tubing machine.
Clark tubing machine.
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(*Advertisements continued on page 66*)

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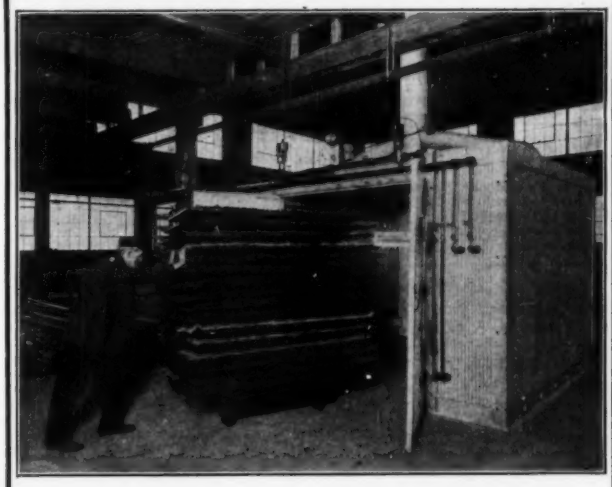

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Among the many important developments which have taken place in the rubber industry none has been more quickly recognized or universally accepted than has The Hunter Process of Conditioning Rubber.

The Hunter Process is a simple and practical method of improving the material out of which your product is made. The principle consists of employing the important natural element of humidity, combined with the proper temperature and circulation.

The largest users of rubber in the world are convinced that the product is benefitted in its physical properties both in the raw and finished state, in that the nerve is increased, it resists the detrimental effects of time, it works more easily in mixing and renders a product of improved quality.

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Compounds can be dried in the same unit, thus eliminating the necessity of duplication in equipment. The operation is simple, automatic, continuous, pleasant and inexpensive.

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Small Advertisement Department — Continued

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FOR SALE: USED MILLS, CALENDERS, CHURNS, TUBING MAchines, vulcanizers, presses, etc., all in fine condition. Write for prices and full descriptions. Address M. Norton & Co., Medford, Massachusetts. (5178)

RUBBER WORKING MACHINERY FOR SALE. COMMUNICATE with L. Albert & Son, Trenton, New Jersey.

FOR SALE: ONE NEW EXPERIMENTAL MILL. ONE 100-GALLON cement mixer. One 15-inch two-opening hydraulic press. All of this equipment is in first-class condition. The E. L. M. Tire & Rubber Co., Racine, Wisconsin.

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WANTED: MILL 8 BY 16 OR 10 BY 20-INCHES.
Four-roll soling calender about 12 by 30 inches.
Hydraulic press 20 by 20 inches.
Accumulator with pump, 2,000 pounds.
Jacketed vulcanizer, 3 by 8 feet or larger.
Perfected tubing machine, Royle No. 2.
Viscol Company, East Cambridge, Massachusetts.

WANTED: ABOUT 54 TO 58-INCH RUBBER MILL AND 6 TO 8-INCH tubing machine. State condition and make, with lowest price. Address Box No. 5481, care of THE INDIA RUBBER WORLD.

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THIRTY YEARS' EXPERIENCE IN RUBBER MANUFACTURING
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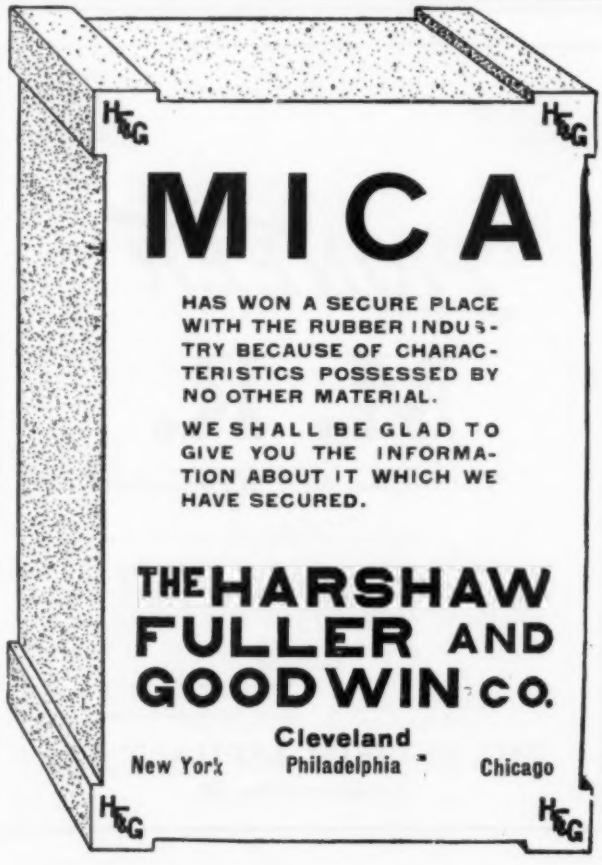
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WE SHALL BE GLAD TO GIVE YOU THE INFORMATION ABOUT IT WHICH WE HAVE SECURED.
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REVISED AND ENLARGED

By Henry C. Pearson, F.R.G.S.

Editor of THE INDIA RUBBER WORLD

The *third revised edition* of this standard work on the technology of crude rubber and its manufacture has been carefully revised and brought up to date.

New chapters also have been added, covering the latest developments of the rubber industry, such as Plantation Para, Synthetic Rubber, Vulcanization without Sulphur, Organic Accelerators, Physical Testing, Analytic Methods, etc. Of special interest and value are the collections of classified practical rubber compounds grouped under the various divisions in rubber manufacture.

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The India Rubber Publishing Co.

25 West 45th Street NEW YORK

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SOUTH BRAINTREE MASSACHUSETTS

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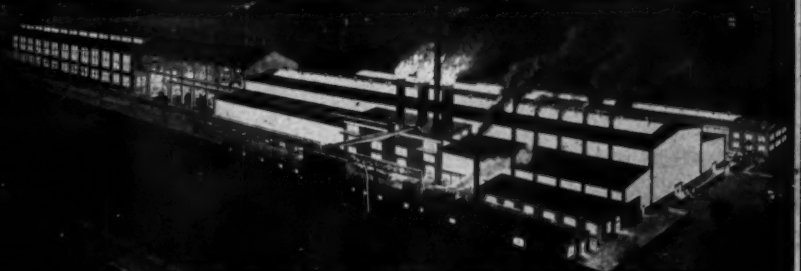

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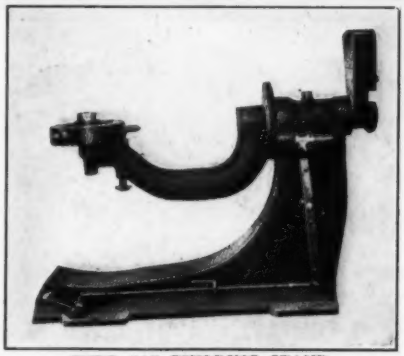

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Operates Easier Than a Light Stand

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Department Y

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Classified List of Manufacturers and Dealers in India-Rubber Goods and Rubber Manufacturers' Supplies.

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Mechanical Goods Generally.

Acme Rubber Mfg. Co., Trenton, N. J.
Archer-Strauss Rubber Co., Framingham, Mass.
Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Co., H. O., Bridgeport, Conn.
Canfield Rubber Co., Bridgeport, Conn.
Cincinnati Rubber Mfg. Co., Cincinnati, O.
Davol Rubber Co., Providence, R. I.
Elkhart Rubber Works, Elkhart, Ind.
Essex Rubber Co., Trenton, N. J.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha & Rubber Mfg. Co., New York.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hale, Alfred, Rubber Co., Atlantic, Mass.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Inland Rubber Co., Chicago, Ill.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
New York Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Perfection Tire & Rubber Co., Ft. Madison, Iowa.
Pirelli & Co., Milan, Italy.
Quaker City Rubber Co., Phila., Pa.
Rubber Products Co., Barberton, Ohio.
Siola Rubber Mfg. Co., Inc., The, New York.

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United & Globe Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.
Western Rubber Co., Goshen, Ind.
Whitehead Bros. Rubber Co., Trenton, N. J.
Woven Steel Hose & Rubber Co., Trenton, N. J.

Asbestos Products.

Raybestos Co., The, Bridgeport, Conn.

Asbestos Textile.

Raybestos Co., The, Bridgeport, Conn.

Belting.

Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati Rubber Mfg. Co., Cincinnati, O.
Goodrich, B. F., Co., The, Akron, Ohio.
Gutta Percha & Rubber Mfg. Co., New York, N. Y.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
New York Rubber Co., New York.

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North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
United & Globe Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Whitehead Bros. Rubber Co., Trenton, N. J.

Belting—Balata.

Boston Belting Co., Boston—New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.

Billiard Cushions.

Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati R. M. Co., Cincinnati, O.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha & Rubber Mfg. Co., N. Y.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
New York Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

Blankets—Printers'

Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha & Rubber Mfg. Co., N. Y.
Hodgman Rubber Co., Tuckahoe, N. Y.
Manhattan Rubber Mfg. Co., Passaic, N. J.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.

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Vulcan Proofing Co., Brooklyn, N. Y.

Brake Lining—Asbestos.

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Thermoid Rubber Co., Trenton, N. J.
United & Globe Rubber Co., Trenton, N. J.
Woven Steel Hose & Rubber Co., Trenton, N. J.

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Canfield Rubber Co., Bridgeport, Conn.
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Western Rubber Co., Goshen, Ind.

Buffers and Springs.

Acme Rubber Mfg. Co., Trenton, N. J.
Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Cincinnati R. M. Co., Cincinnati, O.
Clifton Mfg. Co., Boston, Mass.
Essex Rubber Co., Trenton, N. J.
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Gutta Percha and Rubber, Limited, Toronto, Canada.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber, Mfg. Co., Passaic, N. J
New York Belting & Packing Co., New York.
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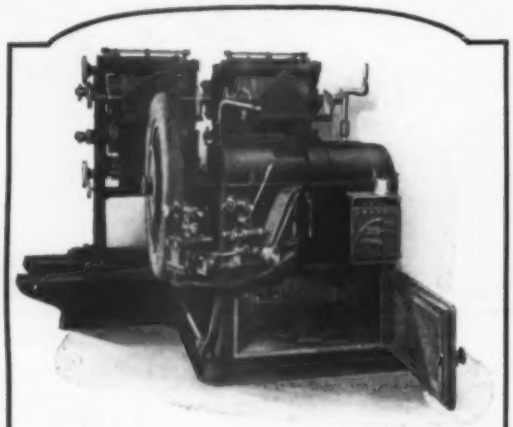
The Hermann Tire Building Machine



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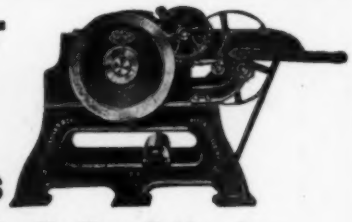

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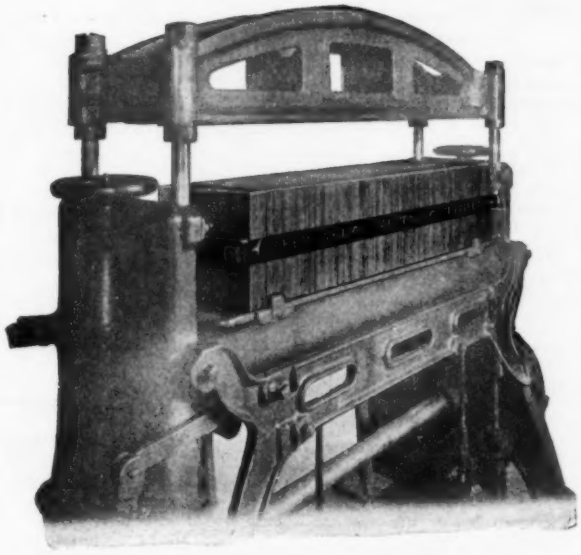

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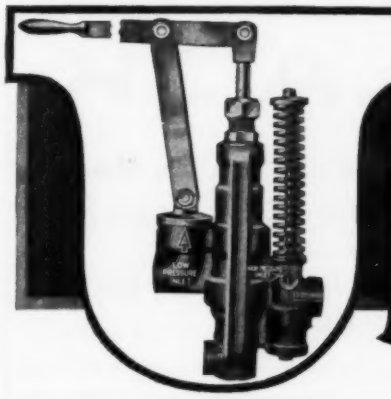

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Voorhees Rubber Mfg. Co., Jersey City.
Western Rubber Co., Goshen, Ind.
Whitehead Bros. Rubber Co., Trenton, N. J.

Card Cloths.

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Mechanical Fabric Co., Providence, R. I.

Cord (Pure Rubber).

Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canfield Rubber Co., Bridgeport, Conn.
Davol Rubber Co., Providence, R. I.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha & Rubber Mfg. Co., N. Y.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.
Western Rubber Co., Goshen, Ind.

Door Springs.

Canfield Rubber Co., Bridgeport, Conn.
Hodgman Rubber Co., New York.
Manhattan Rubber Mfg. Co., Passaic, N. J.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Siola Rubber Mfg. Co., Inc., The, New York.

Experimental Work.

Manhattan Rubber Mfg. Co., Passaic, N. J.
Siola Rubber Mfg. Co., Inc., The, New York.

Fruit Jar Rings.

Acme Rubber Mfg. Co., Trenton, N. J.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Cincinnati Rubber Mfg. Co., Cincinnati, Ohio.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Rubber Products Co., Barberton, O.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

Gas-Bags (Rubber).

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davol Rubber Co., Providence, R. I.
Goodrich, B. F., Co., The, Akron, Ohio.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Tyer Rubber Co., Andover, Mass.
Voorhees Rubber Mfg. Co., Jersey City.

Gaskets, Gasket Tubing and Washers.

Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.

Gaskets, Gasket Tubing and Washers—Continued.

Canfield, H. O., Co., Bridgeport, Conn.
Essex Rubber Co., Trenton, N. J.
Goodrich, B. F., Co., The, Akron.
Gutta Percha & Rubber Mfg. Co., New York.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Hale, Alfred, Rubber Co., Boston, Mass.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
New York Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Reliance Rubber Corporation, Keyport, N. J.
Siola Rubber Mfg. Co., Inc., The, New York.
United & Globe Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

Grain Drill Tubes.

Cincinnati Rubber Mfg. Co., Cincinnati, Ohio.
Gutta Percha and Rubber, Limited, Toronto, Canada.

Hat Bags.

Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Goodrich, B. F., Co., The, Akron, O.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.

Horse Shoe Pads.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Essex Rubber Co., Trenton, N. J.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Tyer Rubber Co., Andover, Mass.
Western Rubber Co., Goshen, Ind.

Hose Bands, Straps and Menders.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Western Rubber Co., Goshen, Ind.
Yerdon, William, Fort Plain, N. Y.

Hose—Armored.

Woven Steel Hose & Rubber Co., Trenton, N. J.

Hose—Rubber.

Air Brake, Fire, Garden. Pneumatic, Suction, Submarine. Vacuum, Dredging Sleeves.

Acme Rubber Mfg. Co., Trenton, N. J.
Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Electric Hose & Rubber Co., Wilmington, Del.
Goodrich, B. F., Co., The, Akron, Ohio.

For Complete Addresses See Advertisements—Index Pages 69-71

MOULDS
For the
Rubber Trade
20 years' experience

DONNELLY MACHINE CO.
Brockton U. S. A. Massachusetts

RUBBERIZED FABRICS

Archer Strauss Rubber Company
Framingham, Mass.

CARBON BLACK
Made by
GODFREY L. CABOT **938-942 Old South Building, Boston, Mass.**
8 Factories; 5 SHIPPING POINTS, viz, Owensport, Nancys Run, Cedar Grove and Clendenin, W. Va., and Lamkin, La.
STOCKS carried at New York, Chicago, St. Louis, San Francisco, London, Paris, etc.
GRADES: Elf, Auk, Monarch, Kalista, Kosmos No. 1 and Kosmos No. 2, etc.
Send for Samples and Prices.

More Than Ordinary Gears

Nuttall BP gears have proved to be the highest quality gears that the engineering field has yet produced for the various industries, including the Rubber Industry.

Their superiority lies in their great strength and wearing qualities. The life of BP gears, even in those industries where gear service is of the severest nature, has proved to be four times that of untreated gears in identical service.

Specify Nuttall BP gears and renew your gears four times less frequently. BP gears can be furnished for any cement and brick plant requirement.

R.D. NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

Nuttall

SCOTT TESTERS

With Autographic Recorders

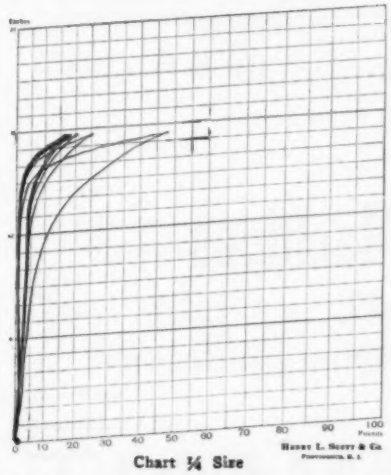


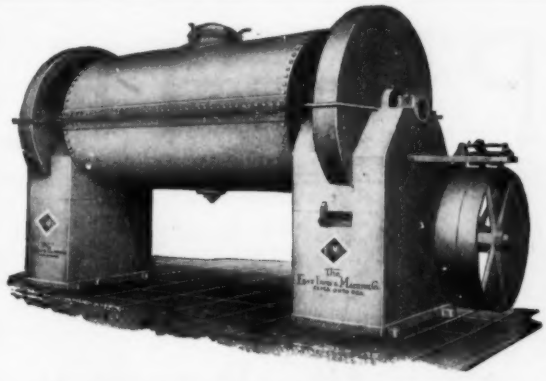
Chart ¼ Size

For Tensile, Fatigue or Friction Tests

The Record Was Taken Shown Here AUTOMATICALLY By the Machine During a Fatigue-Test

Full Information on Request.

HENRY L. SCOTT & COMPANY
Box 963 PROVIDENCE, R. I.



"EIMCO" MIXERS

For Rubber Cements and Solutions

Cut the mixing time in half, make smoother cements, and save a lot of solvent. They are wizards for work.

THE "EIMCO" MASTICATOR AND RUBBER COMPOUND MIXER

Is a fully enclosed machine, operated by one man, and mixes batches of 500 lbs. Cuts labor costs, makes uniform mixes, and eliminates dust and fumes.

The East Iron & Machine Co.
LIMA, OHIO

PHILADELPHIA OFFICE: TRANSPORTATION BLDG.

RUBBER BUYERS' DIRECTORY—Continued.

Hose—Rubber—Continued.

Gutta Percha & Rubber Mfg. Co., New York.
Gutta Percha & Rubber, Ltd., Toronto.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Schrader's, A., Son, Inc., Brooklyn, N. Y.
Thermoid Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Western Rubber Co., Goshen, Ind.
Whitehead Bros. Rubber Co., Trenton, N. J.
Woven Steel Hose & Rubber Co., Trenton, N. J.

Knit Jacket Fire Hose.

United & Globe Rubber Co., Trenton, N. J.

Hose Pipes, Nozzles, Couplings, Clamps, Fittings, Racks and Reels.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Gutta Percha & Rubber Mfg. Co., N. Y.
Manhattan Rubber Mfg. Co., Passaic, N. J.
N. Y. Belting & Packing Co., New York.
Southwark Foundry & Machine Co., Philadelphia, Pa.
United States Rubber Co., New York.
Woven Steel Hose & Rubber Co., Trenton, N. J.

Hose—Rubber Lined.

Cotton and Linen.

Acme Rubber Mfg. Co., Trenton, N. J.
Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati Rubber Mfg. Co., Cincinnati, O.
Fabric Fire Hose Co., New York.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha & Rubber Mfg. Co., N. Y.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
New York Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia.
Stokes, Jos., Rubber Co., Trenton, N. J.
United & Globe Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.
Whitehead Bros. Rubber Co., Trenton, N. J.
Woven Steel Hose & Rubber Co., Trenton, N. J.

Hose Linings.

Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Manhattan Rubber Mfg. Co., Passaic, N. J.

Hose Linings—Continued.

N. J. Car Spring & Rubber Co., Jersey City, N. J.
New York Belting & Packing Co., New York.
Quaker City Rubber Co., Philadelphia.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.

Lawn Sprinklers.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.

Mallets (Rubber).

Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

Matting—Carriage Mats and Stair Treads.

Acme Rubber Mfg. Co., Trenton, N. J.
Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Cambridge Rubber Co., Cambridge Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati R. M. Co., Cincinnati, O.
Essex Rubber Co., Trenton, N. J.
Goodrich, B. F., Co., The, Akron, O.

Matting—Carriage Mats and Stair Treads—Continued.

Gutta Percha & Rubber Mfg. Co., New York.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Hodgman Rubber Co., New York.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
New York Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.
Western Rubber Co., Goshen, Ind.

Mold Work.

(See Mechanical Rubber Goods.)

Acme Rubber Mfg. Co., Trenton, N. J.
Boston Belting Co., Boston, Mass.
Cambridge Rubber Co., Cambridge, Mass.
Canfield, H. O., Co., Bridgeport, Conn.
Canfield Rubber Co., Bridgeport, Conn.
Cincinnati R. M. Co., Cincinnati, O.
Clifton Manufacturing Co., Boston, Mass.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Elkhart Rubber Works, Elkhart, Ind.
Essex Rubber Co., Trenton, N. J.
Goodrich, B. F., Co., The, Akron, Ohio.
Gutta Percha & Rubber Mfg. Co., New York.
Gutta Percha & Rubber, Ltd., Toronto.
Hale, Alfred, Rubber Co., Atlantic, Mass.
Hewitt Rubber Co., Buffalo, N. Y.
Hodgman Rubber Co., New York.
Home Rubber Co., Trenton, N. J.

For Complete Addresses See Advertisements—Index Pages 69-71

PRODUCTION

counts now and in the future for more than it ever has before

Are you using

Allen Patented and Standard Machines

for the working of rubber?

Quick Deliveries :: Send for Quotations

More than 325 manufacturers located in 31 states and 9 foreign countries are using

ALLEN EQUIPMENT

MADE IN ERIE, PENNA., U. S. A.

CARBON BLACK

An inert pigment which smoothes and toughens tire compounds and materially lessens claims for adjustments.

Equally adapted to other compounds where durability and resiliency are required.

SEAVER & CO. Established 1882 — 3 TREMONT ROW, Olympia Bldg. BOSTON, MASS.

Materials
for
Rubber Industries

THE
H. J. ADAMS COMPANY
Second National Building AKRON, OHIO

Gutta Percha Tissue

The Dry Process Adhesive Sheet Cement often called "SHEET RUBBER" any width from ½ inch to 37 inches, also

COLORLESS BALATA FILM

Peters Brothers Rubber Co., Inc.
Specialists—3rd Generation
PETERS BUILDING
4109-4119 Park Ave., cor. 175th St.
New York City
Cable Address—STICTUIT, NEW YORK

The Akron Standard Mold Company

AKRON - - - - - OHIO

Molds—Cores—Non-Skid designs of every description—Tire Building Stands—Tube Wrapping and Unwrapping Machines—Stripping Tables

and

A General Line of Machine Work

"The Universal Coal Saver"

85% MAGNESIA

in SECTIONAL, BLOCK & PLASTIC FORMS

Send to-day for instructive catalogue

EHRET'S MAGNESIA PIPE & BOILER COVERINGS *pays permanent dividends*

USE EHRET'S POWDERED MAGNESIA CARBONATE *in the manufacturing of* rubber goods, varnishes, lithographic inks, glass, pharmaceutical preparations, cosmetics, etc.

EHRET MAGNESIA MANUFACTURING CO.
·VALLEY FORGE · PA·
Bently Code - Cable Address
EHRET, VALLEY FORGE

RUBBER FACTICE
with
TENSILE STRENGTH

TON OR CARLOAD LOTS
Immediate Delivery
CHICAGO BROOKLYN
IDEAL ROLLER & MFG. CO.
Bush Bldg. 95 Brooklyn

RUBBER BUYERS' DIRECTORY—Continued.

Mold Work—Continued.

Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia.
Reliance Rubber Corporation, Keyport, N. J.
Rubber Products Co., Barberton, O.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United & Globe Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.
Whitall Tatum Co., New York.

Oil Well Supplies.

Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Electric Hose & Rubber Co., Wilmington, Del.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha & Rubber Mfg. Co., N. Y.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
Quaker City Rubber Co., Philadelphia, Pa.
United & Globe Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.
Western Rubber Co., Goshen, Ind.

Packing.

(See Mechanical Rubber Goods.)

Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati Rubber Mfg. Co., Cincinnati, O.
Elkhart Rubber Works, Elkhart, Ind.
Essex Rubber Co., Trenton, N. J.
Goodrich, B. F., Co., The, Akron, Ohio.
Gutta Percha & Rubber Mfg. Co., New York.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Raybestos Co., The, Bridgeport, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
United & Globe Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.
Whitehead Bros. Rubber Co., Trenton, N. J.

Packing—Asbestos.

Raybestos Co., The, Bridgeport, Conn.

Paper Machine Rolls and Deckle Straps.

Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd. Montreal, Canada.

Paper Machine Rolls and Deckle Straps—Continued.

Farrel Foundry & Machine Co., Ansonia, Conn.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha & Rubber Mfg. Co., N. Y.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.

Plumbers' Supplies. Force Cups, Fuller Balls.

Acme Rubber Mfg. Co., Trenton, N. J.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Co., H. O., Bridgeport, Conn.
Canfield Rubber Co., Bridgeport, Conn.
Elkhart Rubber Works, Elkhart, Ind.
Essex Rubber Co., Trenton, N. J.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hodgman Rubber Co., New York.
Home Rubber Co., Trenton, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Reliance Rubber Corporation, Keyport, N. J.
Rubber Products Co., Barberton, O.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.
Western Rubber Co., Goshen, Ind.

Rolls—Rubber Covered.

Acme Rubber Mfg. Co., Trenton, N. J.
Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati R. M. Co., Cincinnati, O.
Clifton Manufacturing Co., Boston.
Goodrich, B. F., Co., The, Akron, O.

Rolls — Rubber Covered—Cont.

Gutta Percha & Rubber Mfg. Co., N. Y.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Western Rubber Co., Goshen, Ind.

Sewing Machine Rubbers.

Canfield Rubber Co., Bridgeport, Conn.
Goodrich, B. F., Co., The, Akron, O.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Siola Rubber Mfg. Co., Inc., The, New York.
Western Rubber Co., Goshen, Ind.

Specialties.

Davol Rubber Co., Providence, R. I.
Goodrich, B. F., Co., The, Akron, O.
Indiana Rubber Insulated Wire Co., Jonesboro, Ind.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Reliance Rubber Corporation, Keyport, N. J.
Siola Rubber Mfg. Co., Inc., The, New York.

Tiling.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh.

For Complete Addresses See Advertisements—Index Pages 69-71

THE VULCANIZED RUBBER CO.

Manufacturers of

Hard Rubber Goods of every description

251 FOURTH AVENUE
New York

WORKS - MORRISVILLE, PA.

LIGHT HEAVY

CALCINED

CHEAPER **MAGNESIA** BETTER

CHEAPER—Because it is mined, calcined, ground, packed and shipped by one organization (the largest factor in Magnesite) and is distributed with minimum selling expense.

BETTER—Because single control of production permits of careful selection of raw material and guarantees uniformity.

Invite our competition by requesting samples and prices now.

The Tyler Patterson Co.

CHEMICALS

Cleveland Ohio

Z i n c

aids

Rubber Manufacturing Efficiency

Workmen can perform their various tasks best in a clean plant. Zinc Oxide used as a compounding ingredient insures a clean, light compounding room.

Other factors commending the use of this material in increased proportions include its ability to mix easily and the insurance it affords for perfect adhesion between layers in your products. Due to its uniform quality

Horse Head Zinc Oxide

renders formulae changes unnecessary and also helps to keep down overhead costs otherwise made necessary by exacting supervision and inspection.

See our exhibit in Booths Nos. 521 and 523, Seventh Annual Chemical Exposition, held at Eighth Coast Artillery Armory, New York, Week of September 12.

THE NEW JERSEY ZINC COMPANY

160 Front Street (Established 1848) New York City

CHICAGO
Mineral Point Zinc Company
1111 Marquette Building

New Jersey Zinc

PITTSBURGH
The New Jersey Zinc Co. (of Pa.)
1439 Oliver Building

The World's Standard for Zinc Products

RUBBER BUYERS' DIRECTORY—Continued.

Tiling—Continued.

United & Globe Rubber Co., Trenton, N. J.
Western Rubber Co., Goshen, Ind.

Tubing.

(See Mechanical Rubber Goods.)

Acme Rubber Mfg. Co., Trenton, N. J.
American Hard Rubber Co., New York.
Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Cincinnati R. M. Co., Cincinnati, O.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Electric Hose & Rubber Co., Wilmington, Del.
Essex Rubber Co., Trenton, N. J.
Faultless Rubber Co., Ashland, Ohio.
Gutta Percha & Rubber Mfg. Co., New York.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Hodgman Rubber Co., New York.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Reliance Rubber Corporation, Keyport, N. J.
Rubber Products Co., Barberton, O.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United & Globe Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Western Rubber Co., Goshen, Ind.

Tubing—Continued.

Whitall Tatum Co., New York.
Whitehead Bros. Rubber Co., Trenton, N. J.

Valve Discs.

American Hard Rubber Co., New York.
Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Cincinnati R. M. Co., Cincinnati, O.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

Valves.

(See Mechanical Rubber Goods.)

Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Elkhart Rubber Works, Elkhart, Ind.
Essex Rubber Co., Trenton, N. J.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha & Rubber Mfg. Co., New York.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
New York Rubber Co., New York.

Valves—Continued.

North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Siola Rubber Mfg. Co., Inc., The, New York.
United & Globe Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.
Whitehead Bros. Rubber Co., Trenton, N. J.

Valves—Balata.

Boston Belting Co., Boston, Mass.

Valves, Balls—Condensor, Cold and Hot Water.

Boston Belting Co., Boston, Mass.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Siola Rubber Mfg. Co., Inc., The, New York.
Western Rubber Co., Goshen, Ind.

Vulcanite Emery Wheels.

Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
United States Rubber Co., New York.

Wringer Rolls.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati R. M. Co., Cincinnati, O.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha and Rubber, Limited, Toronto.
Home Rubber Co., Trenton, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

DRUGGISTS' AND STATIONERS' SUNDRIES.

Atomizers. Nipples.
Bandages. Syringes.
Bulbs. Water Bottles.

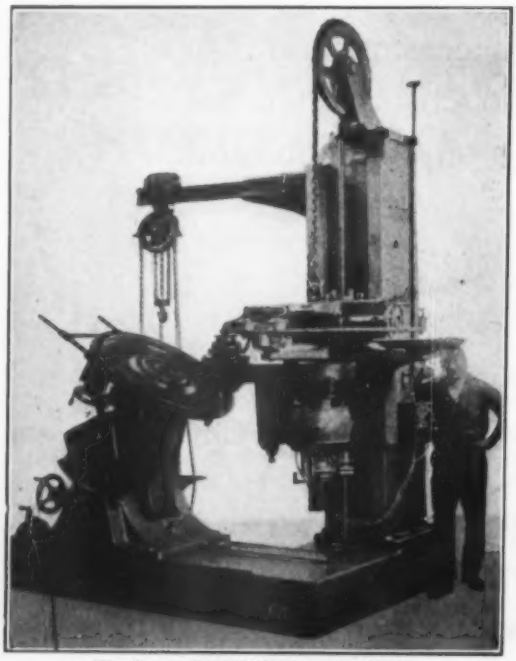
Druggists' Sundries, Generally.

American Hard Rubber Co., New York.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Goodrich, B. F., Co., The, Akron, Ohio.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Pirelli & Co., Milan, Italy.
Rubber Products Co., Barberton, O.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
Vulcanized Rubber Co., New York.
Whitall Tatum Co., New York.

Air Goods.

Canadian Consolidated Rubber Co., Ltd. Montreal, Canada.
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Whitall Tatum Co., N. Y.

For Complete Addresses See Advertisements—Index Pages 69-71



The Gorton Tire Mold Engraving Machine

Heavy Non-Skid Tire Mold Engraving Machine

Adapted to cutting treads in molds or rings 44 inches in diameter and less. Machine equipped with indexing attachment. Master Mechanic of a large rubber company recently stated that the Gorton machine would beat any competing tool by 100 per cent. Leaders in the rubber industry doing the best and fastest work in tire mold engraving are using our machines.

They are to be found in such plants as

Morgan & Wright (four); Goodyear Tire & Rubber Co. (eleven); Ajax Rubber Co. (two); Claflin Engineering Co. (two); Rubber Machinery Shops, Kitchener, Ont. (two); Dunlop Rubber Co., Birmingham, England (three); Dunlop Rubber Co., Melbourne, Australia (one); North British Rubber Co., Edinburgh, Scotland (one); Hartford Rubber Wks. (one); Fisk Rubber Co. (one); Cleveland Rubber Mold Foundry & Machine Co. (one).

MADE BY

GEORGE GORTON MACHINE CO.

RACINE, WISCONSIN

Also Makers of Machines for Engraving Letters, Figures, Designs on Bicycle and Motorcycle Molds

CORD FABRICS
EXCLUSIVELY
Worcester Tire Fabric Co.

624 Sec. National Bldg.
Akron, Ohio

Worcester, Mass.

PIRELLI & CO.

Milan (Italy)

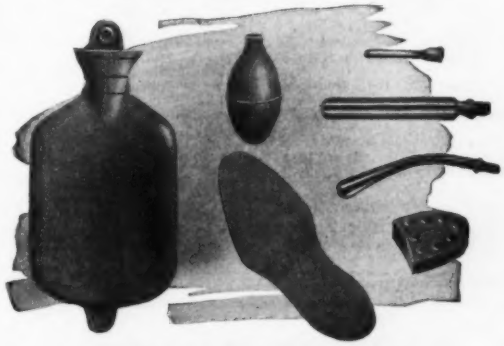
Manufacturers of tyres, of all other classes of India Rubber and Gutta-Percha articles and of electric cables and wires for all purposes—Cable laying contractors.

Head Office:—Via Ponte Seveso 21, Milan—Italy

Works: *Italy*—Milan
Bicocca
Spezia
Vercurago
Spain—Villanueva y Geltrù
(near Barcelona)
England—Southampton
Argentina—Buenos Aires

Sale Branches: London, Paris, Barcelona, Bruxelles, Geneva, Buenos Aires and in the principal Italian towns.

Manufacturers of
MOLDS
for Mechanical Rubber Goods



MOLDS FOR

Heels; Soles; Hot Water Bottles; Syringe Bags; Bulbs; Battery Jars and Covers; Hard Rubber Pipes; etc.

ALSO

Die Sinkers and Engravers. Medallion Dies a Specialty.

THE MECHANICAL MOLD & MACHINE CO.

25-33 East Crosier St., Akron, Ohio

YOUR INQUIRIES SOLICITED

William H. Stiles & Co.
1 LIBERTY ST., NEW YORK
IMPORTERS and MERCHANTS
CRUDE RUBBER

RUBBER BUYERS' DIRECTORY—Continued.

Air Goods—Valves for.

Schrader's, A., Son, Inc., New York.

Balloons (Toy).

Faultless Rubber Co., Ashland, Ohio.

Balls, Dolls and Toys.

Davol Rubber Co., Providence, R. I.
Essex Rubber Co., Trenton, N. J.
Faultless Rubber Co., Ashland, Ohio.
New York Rubber Co., New York.
United States Rubber Co., New York.

Bathing Caps.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

Bulbs.

Faultless Rubber Co., Ashland, Ohio.
Goodrich, B. F., Co., The, Akron, Ohio.
Reliance Rubber Corporation, Keyport, N. J.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Whitall Tatum Co., New York.

Combination Fountain Syringe and Hot Water Bottle Fixtures.

Schrader's, A., Son, Inc., New York.

Combs.

American Hard Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Vulcanized Rubber Co., New York.

Elastic Bands.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davol Rubber Co., Providence, R. I.
Easthampton Rubber Thread Co., Easthampton, Mass.
Goodrich, B. F., Co., The, Akron, O.
Hale, Alfred, Rubber Co., Boston, Mass.
Hodgman Rubber Co., New York.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Electricians' and Surgeons' Gloves.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Rubber Products Co., Barberton, O.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.

Erasive Rubbers.

Faultless Rubber Co., Ashland, Ohio.
Goodrich, B. F., Co., The, Akron, O.
North British Rubber Co., Ltd., Edinburgh, Scotland.

Finger Cots.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davol Rubber Co., Providence.
Faultless Rubber Co., Ashland, Ohio.
Goodrich, B. F., Co., The, Akron, O.
Hodgman Rubber Co., New York.
Rubber Products Co., The, Barberton, O.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.
Whitall Tatum Co., N. Y.

Fountain Syringes

Davidson Rubber Co., Boston, Mass.
Tyer Rubber Co., Andover, Mass.

Gutta Percha Tissue.

Peters Bros. Rubber Co., New York.

Hard Rubber Goods.

American Hard Rubber Co., New York.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davidson Rubber Co., Boston.
Davol Rubber Co., Providence, R. I.
Goodrich, B. F., Co., The, Akron, O.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Seamless Rubber Co., Inc., New Haven, Conn.
Stokes, Joseph, Rubber Co., Trenton, N. J.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Vulcanized Rubber Co., New York.

Hospital Sheetings.

Archer Rubber Co., Milford, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Cambridge Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davol Rubber Co., Providence, R. I.
Goodrich, B. F., Co., The, Akron, Ohio.
Hale, Alfred, Rubber Co., Atlantic, Mass.
Hodgman Rubber Co., New York.

Hospital Sheetings—Continued.

Meade Rubber Co., Stoughton, Mass.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Vulcan Proofing Co., Brooklyn, N. Y.

Hot Water Bottle Stoppers.

Schrader's, A., Sons, Inc., New York.

Hot Water Bottles, Throat Bags, Ice Bags and Ice Caps.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Goodrich, B. F., Co., The, Akron, O.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Rubber Products Co., The, Barberton, O.
Seamless Rubber Co., Inc., New Haven, Conn.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Whitall Tatum Co., N. Y.

Life Preservers.

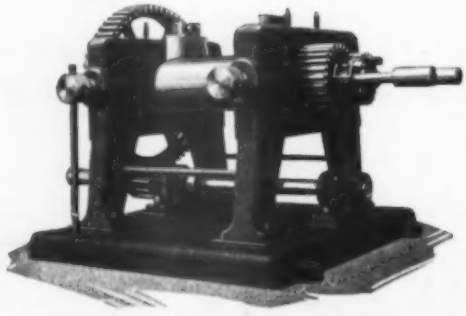
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

Nipples.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.

For Complete Addresses See Advertisements—Index Pages 69-71

The Banner Machine Company
COLUMBIANA OHIO



SINGLE EXPERIMENTAL MILL

Molds, Cores and Equipment for Fabric and Cord Tires, Banner Tire Building Machines, Roller Bearing Tire Stands, Tire Section Cutters, Fabric Dryers, Cord Fabric Impregnators, Tube Wrapping Lathe, Rag Wrapping Machines, Tube Removing Machines, Experimental Mills and Washers.

COMPLETE LINE OF HOSE MAKING MACHINERY.

All Kinds of Tire Shop Equipment

Second Hand, New and Rebuilt

RUBBER MACHINERY

for sale at one-half the cost of new machinery.

Come and see me

PHILIP McGRORY

25-75 Pashley Avenue Trenton, New Jersey

EMBOSSING CALENDERS

For Artificial Leather, Oil Cloth, Carriage and Automobile Covers

DRYING MACHINES

with Copper or tinned iron Cylinders for Cotton Ducks Drills and Sheetings

The Textile-Finishing Machinery Co.

Office, No. 83 Exchange Place
PROVIDENCE, R. I.

TORON

PAT-PENDING.

Fabrics Conditioned for Vulcanization

By treatment with a new non colloidal sulphur compound.

ADVANTAGES OF TORON TREATMENT:

1. Increased Tensile Strength.
2. Protection against oxidation.
3. Greater Flexibility.
4. Gives to fabrics an affinity for rubber.

Giving fabrics an affinity for rubber insures more uniform frictioning and eliminates skips; enables greater flow of rubber into interstices of fabrics producing higher friction pulls. In the case of cords it eliminates expensive and dangerous spreading process and gives better results than the latter.

We are prepared to treat your fabric as well as supply treated fabrics of our own manufacture.

SALMON FALLS MFG. CO.

50 STATE STREET BOSTON, MASS.

Synpro Products for Rubber Compounds

LIQUID RUBBER, the superflux—provides tack, aging qualities—prevents scorching on the mill—permits ease of mixing heavily loaded stocks.

GRANULATED MINERAL RUBBER, saves time of breaking up solid material, saves labor and milling time. Any melting point and penetration.

ROSIN OIL, all grades, prepared for your individual requirements.

DRY COLORS, any shade of red, green, blue, yellow, purple, crimson sulphuret, golden sulphuret for auto tubes and toy balloons.

Send us your inquiries.

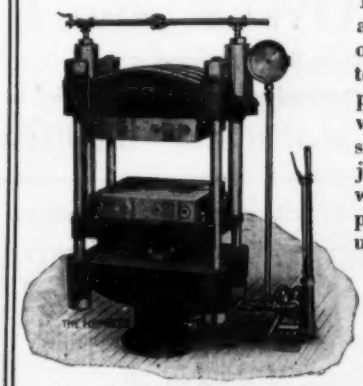
THE SYNTHETIC PRODUCTS CO.

Merwin and Center Streets, CLEVELAND, O.

H-P-M
HYDRAULIC PRESSES

for heating and chilling operations in the making of rubber and composition goods.

Built in Many Standard Sizes



42 ton Hot Plate Press used by the K. W. Ignition Co. The press is adapted for either hot or cold plate work.

The number of plates and the size of the openings can be made to suit conditions. The plates are connected with our special swinging or telescopic joint connections, which permit the plates to move while under pressure.

We are in position to furnish complete installations—presses, pumps, valves and fittings.

Send for Complete Information

The Hydraulic Press Mfg. Co.

Mount Gilead, Ohio

39-41 Cortlandt St., New York City

RUBBER BUYERS' DIRECTORY—Continued.

Nipples—Continued.

Seamless Rubber Co., Inc., New Haven, Conn.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Whitall Tatum Co., N. Y.

Shower Bath Sprinklers.

Davol Rubber Co., Providence.
Hodgman Rubber Co., New York.
Schrader's, A., Son, Inc., New York.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.

Sponges.

Faultless Rubber Co., Ashland, Ohio.

Stationers' Sundries.

American Hard Rubber Co., New York.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati Rubber Mfg. Co., Cincinnati, Ohio.
Davol Rubber Co., Providence, R. I.
Goodrich, B. F., Co., The, Akron, O.
Hodgman Rubber Co., New York.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Stopples (Metal).

Schrader's, A., Son, Inc., New York.

Stopples (Rubber).

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Davidson Rubber Co., Boston.
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., New York.
New York Belting & Packing Co., N. Y.
Seamless Rubber Co., Inc., New Haven, Conn.

Stopples (Rubber).—Continued.

Siola Rubber Mfg. Co., Inc., The, New York.

Thread.

Easthampton Rubber Thread Co., Easthampton, Mass.
Goodrich B. F. Co., The, Akron, O.
Mechanical Fabric Co., Providence, R. I.
United States Rubber Co., New York.

Tobacco Pouches.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davol Rubber Co., Providence, R. I.
The B. F. Goodrich Co., Akron, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Rubber Products Co., The, Barberton, O.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

MACKINTOSHED AND SURFACE GOODS.

Airplane and Balloon Cloths.

Goodrich, B. F., Co., The, Akron, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

Air Mattresses.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davol Rubber Co., Providence, R. I.
Hale, Alfred, Rubber Co., Boston, Mass.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

Aprons—Rubber.

Archer Rubber Co., Milford, Mass.
Cambridge Rubber Co., Cambridge, Mass.
Seamless Rubber Co., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.

Barbers' Bibs.

Canfield Rubber Co., Bridgeport, Conn.
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., New York.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Bellows Cloths.

Archer Rubber Co., Milford, Mass.
Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Cambridge Rubber Co., Cambridge, Mass.
Clifton Manufacturing Co., Boston, Mass.
Goodrich, B. F., Co., The, Akron, Ohio.
Hodgman Rubber Co., New York.
United States Rubber Co., New York.

Blankets—Camp and Hospital.

Archer Rubber Co., Milford, Mass.
Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Cambridge Rubber Co., Cambridge, Mass.
du Pont, E. I., De Nemours & Co., New York.
Clifton Manufacturing Co., Boston, Mass.
Goodrich, B. F., Co., The, Akron, Ohio.
United States Rubber Co., New York.

Calendering.

Archer Rubber Co., Milford, Mass.
Cambridge Rubber Co., Cambridge, Mass.
Canfield Rubber Co., Bridgeport, Conn.
Goodrich, B. F., Co., The, Akron, Ohio.
Hodgman Rubber Co., New York.
United States Rubber Co., New York.

Carriage Ducks and Drills.

Acme Rubber Mfg. Co., Trenton, N. J.

Carriage Ducks and Drills.—Continued.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Clifton Manufacturing Co., Boston, Mass.
du Pont, E. I., de Nemours & Co., New York.
Empire Rubber & Tire Co., Trenton, N. J.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

Clothing and Mackintoshes.

Apsley Rubber Co., Hudson, Mass.
Archer Rubber Co., Milford, Mass.
Badger Raincoat Co., Port Washington, Wis.
Cambridge Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Clifton Mfg. Co., Boston, Mass.
du Pont, E. I., De Nemours & Co., New York.
Goodrich, B. F., Co., The, Akron, Ohio.
Hodgman Rubber Co., New York.
North British Rubber Co., Edinburgh, Scotland.
Pirelli & Co., Milan, Italy.
United States Rubber Co., New York.

Dress Shield Material.

Archer Rubber Co., Milford, Mass.
Cambridge Rubber Co., Cambridge, Mass.
Hodgman Rubber Co., New York.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Vulcan Proofing Co., Brooklyn, N. Y.

Diving Apparatus.

Hale, Alfred, Rubber Co., Boston, Mass.
Hodgman Rubber Co., New York.
Schrader's, A., Son, Inc., Brooklyn.

Horse Covers.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.

For Complete Addresses See Advertisements—Index Pages 69-71

THE AKRON ENGINEERING CO.

AKRON, OHIO

Consulting, Designing and Operating Engineers

POWER and RUBBER PLANTS

Specializing in Steam and Hydraulic — *Specializing in Fabric and Cord TIRES*

All tires guaranteed when manufactured under our SPECIFICATION AND SUPERVISION

TIRES, MECHANICAL, DRUGGIST SUNDRIES AND RECLAIMING

WATERPROOF COATS

A Quality-Made Raincoat for Wholesale Distribution

Write for Attractive Proposition

BADGER RAINCOAT CO.

Port Washington, Wis.

ARCHER RUBBER CO.

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Aprons, Blankets and Ponchos
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SINGAPORE
Rubber Importers, Limited

AKRON, OHIO
Second National Bldg.

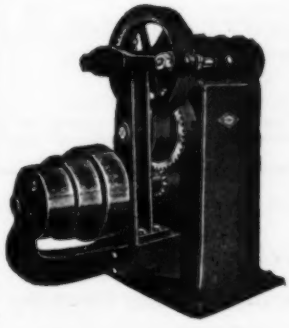
CRUDE RUBBER
Washed and Dried Rubber a Specialty

HYDRAULIC PRESSES
In All Standard Sizes
EXPERIMENTAL MILLS and CALENDERS
Write for Prices and Specifications.
Sieverkropp Engine Company
Racine, Wisconsin

The
Seamless Rubber Company
Incorporated
New Haven, Conn.

Manufacturers of
Medical Hospital Rubber Goods, Bathing Caps, Tennis Balls, Hand Balls, Striking Bags, Basket Ball and Football Bladders.

Prices and Samples Sent on Application



Manufacturers of the
"HOUSATONIC"
Insulating, Tubing and Rubber Straining Machines.

The Housatonic Machine and Tool Co.
Bridgeport, Conn.

THE WELLMAN COMPANY
are manufacturers of
THE WELLMAN SOLE CUTTING MACHINE
for cutting soles, taps and other irregular shapes at any bevel from 27° to 90° from sheet stock. They are also in a position to work out many of your engineering problems, to design and build any tool or light machine needed in your factory.
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WELLMAN COMPANY
Engineers and Machinists
MEDFORD, MASS.

Mason Reducing Valves
For the accurate control and regulation of steam pressures used in connection with vulcanizers, presses, etc.
SIMPLE :: COMPACT
RELIABLE
SEND FOR CATALOGUE
MASON REGULATOR CO.
1191 Adams St. Dorchester, Mass.

RUBBER BUYERS' DIRECTORY—Continued.

Horse Covers—Continued.

Goodrich, B. F., Co., The, Akron, Ohio.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.

Horse Cover Material.

Hodgman Rubber Co., New York.
United States Rubber Co., New York.

Leggings.

Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.

Leather, Artificial.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Plymouth Rubber Co., Canton, Mass.

Leggings (Material).

Goodrich, B. F., Co., The, Akron, Ohio.
Hodgman Rubber Co., New York.

Piano Player Cloths.

Vulcan Proofing Co., Brooklyn, N. Y.

Ponchos.

Archer Rubber Co., Milford, Mass.
Cambridge Rubber Co., Cambridge, Mass.
Clifton Manufacturing Co., Boston, Mass.
Goodrich, B. F., Co., The, Akron, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

Printing on Rubber Surface.

Archer Rubber Co., Milford, Mass.

Proofing.

Archer Rubber Co., Milford, Mass.
Archer-Strauss Rubber Co., Framingham, Mass.
Cambridge Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Goodrich, B. F., Co., The, Akron, Ohio.
Hale, Alfred, Rubber Co., Atlantic, Mass.
Hodgman Rubber Co., New York.
Siola Rubber Mfg. Co., Inc., The, New York.
Toledo Auto Fabrics Co., The, Toledo, Ohio.

Rubber Coated Cloths.

Archer Rubber Co., Milford, Mass.
Archer-Strauss Rubber Co., Framingham, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Cambridge Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Clifton Manufacturing Co., Boston, Mass.
du Pont, E. I., De Nemours & Co., New York.
Goodrich, B. F., Co., The, Akron, Ohio.
Hale, Alfred, Rubber Co., Atlantic, Mass.
Hodgman Rubber Co., New York.
Mechanical Fabric Co., Providence, R. I.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Toledo Auto Fabrics Co., The, Toledo, Ohio.
United States Rubber Co., New York.

Spreading—Cord Fabric.

Vulcan Proofing Co., Brooklyn, N. Y.

RUBBER FOOTWEAR.

Boots and Shoes.

Apsley Rubber Co., Hudson, Mass.
Cambridge Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Goodrich, B. F., Co., The, Akron, Ohio.
Gutta Percha & Rubber, Limited, Toronto, Canada.
Miner Rubber Co., Granby, Quebec.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.

Heels.

Conant & Co., Boston, Mass.
Meade Rubber Co., Stoughton, Mass.

Heels and Soles.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Cambridge Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.

Heels and Soles—Continued.

Canfield Rubber Co., Bridgeport, Conn.
Essex Rubber Co., Trenton, N. J.
Foster Rubber Co., Boston, Mass.
Goodrich, B. F., Co., The, Akron, Ohio.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hale, Alfred, Rubber Co., Atlantic, Mass.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Panther Rubber Manufacturing Co., Stoughton, Mass.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Western Rubber Works, Goshen, Ind.

Heel Burrs.

Independent Nail & Packing Co., Bridgewater, Mass.

Heel Nails.

Independent Nail & Packing Co., Bridgewater, Mass.
United Shoe Machinery Corporation, Boston, Mass.

Shoe Findings and Specialties.

Clifton Manufacturing Co., Boston, Mass.
Essex Rubber Co., Trenton, N. J.
Foster Rubber Co., The, Boston, Mass.
Meade Rubber Co., Stoughton, Mass.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Knitting Co., Pawtucket, Mass.
United States Rubber Co., New York.

Soling.

Boston Belting Co., Boston, Mass.
Cambridge Rubber Co., Cambridge, Mass.
Gutta Percha & Rubber, Ltd., Toronto, Can.
Panther Rubber Mfg. Co., Stoughton, Mass.
Siola Rubber Mfg. Co., Inc., The, New York.

Wading Pants.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Hale, Alfred, Rubber Co., Boston, Mass.
Hodgman Rubber Co., New York.

Wading Pants—Continued.

North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

DENTAL AND STAMP RUBBER.

Dental Gum.

Goodrich, B. F., Co., The, Akron, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Siola Rubber Mfg. Co., Inc., The, New York.

Dentists' Sundries.

Siola Rubber Mfg. Co., Inc., The, New York.

Rubber Dam.

Davol Rubber Co., Providence, R. I.
Goodrich, B. F., Co., The, Akron, O.
Hodgman Rubber Co., New York.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Sponge Rubber.

Faultless Rubber Co., Ashland, Ohio.
United States Rubber Co., New York.

Stamp Gum.

Goodrich, B. F., Co., The, Akron, O.
Gutta Percha & Rubber, Ltd., Toronto.
Hale Rubber Co., Alfred, Boston, Mass.
Siola Rubber Mfg. Co., Inc., The, New York.

ELECTRICAL.

Electrical Supplies.

American Hard Rubber Co., New York.
Canfield Rubber Co., Bridgeport, Conn.
Electric Hose & Rubber Co., Wilmington, Del.
Hodgman Rubber Co., New York.
Siola Rubber Mfg. Co., Inc., The, New York.

For Complete Addresses See Advertisements—Index Pages 69-71

CAMCO
CAMBRIDGE·RUBBER·CO·
PRODUCTS OF QUALITY
RUBBER FOOTWEAR
CANVAS FOOTWEAR
OUTING SHOES
HEELS AND SOLES
MOLDED GOODS
RUBBER CLOTHING
MACKINTOSHES
CALENDERING
PROOFING
CAMBRIDGE·RUBBER·CO.
·CAMBRIDGE·MASS·U·S·A·

MAHLOW & WYCKOFF, Trenton, N.J.
MACHINISTS AND TOOLMAKERS
Hard Rubber and Soft Rubber Molds
Special Machinery. Machinery Built to Order
If you have operations which you now do by hand and wish to do the same by machine, we would be pleased to have you take the matter up with us.

LOTHAR E. WEBER, Ph. D.
Analytical and Consulting Rubber Chemist
729 Boylston St., Boston

BERGENPORT BRAND
PURE SOFT SULPHUR
PREPARED ESPECIALLY FOR
Rubber Manufacturers
T. & S. C. WHITE CO.
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Books for Rubber Men

CRUDE RUBBER AND COMPOUNDING INGREDIENTS

REVISED AND ENLARGED ***By Henry C. Pearson***

Carefully revised and brought up to date. New chapters also have been added, covering the latest developments of the rubber industry, such as plantation pará, synthetic rubber, vulcanization without sulphur, organic accelerators, physical testing, analytic methods, etc. Of course interest and value are the collections of classified practical rubber compounds grouped under the various divisions in rubber manufacture.

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North British Rubber Co., Ltd., Edinburgh, Scotland.
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United States Rubber Co., New York.

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United States Rubber Co., New York.

Wire—Lead Covered.

United States Rubber Co., New York.

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Hodgman Rubber Co., New York.
United States Rubber Co., New York.

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Goodrich, B. F., Co., The, Akron, O.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

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Sporting Goods—Continued.

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Rubber Products Co., Barberton, O.
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Pennsylvania Rubber Co., Jeannette, Pa.
Seamless Rubber Co., Inc., New Haven, Conn.

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Fisk Rubber Co., Chicopee Falls, Mass.
General Tire & Rubber Co., Akron, Ohio.
Siola Rubber Mfg. Co., Inc., The, New York.

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Boston Woven Hose & Rubber Co., Cambridge, Mass.
Cambridge Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
du Pont, E. I., De Nemours & Co., New York.
Hodgman Rubber Co., New York.
Mutty, L. J., Co., Boston, Mass.

Auto Top Fabrics—Continued.

North British Rubber Co., Ltd., Edinburgh, Scotland.
Siola Rubber Mfg. Co., Inc., The, N. Y.
Taylor, Armitage & Eagles, Inc., N. Y.
Toledo Auto Fabrics Co., The, Toledo, Ohio.
Turner Co., J. Spencer, New York.
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National-Standard Co., Niles, Mich.

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Goodrich, B. F., Co., The, Akron, O.
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Hewitt Rubber Co., Buffalo, N. Y.
Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.
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McGraw Tire & Rubber Co., The, Cleveland, Ohio.
Miller Rubber Co., The, Akron, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Parker Tire & Rubber Co., Indianapolis, Ind.
Pennsylvania Tire & Rubber Co., Jeanette, Pa.
Rubber Products Co., Barberton, O.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.

Mats—Automobile.

(See Matting and Mechanical Rubber Goods.)

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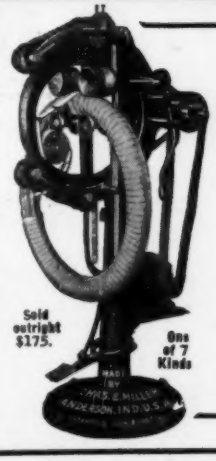

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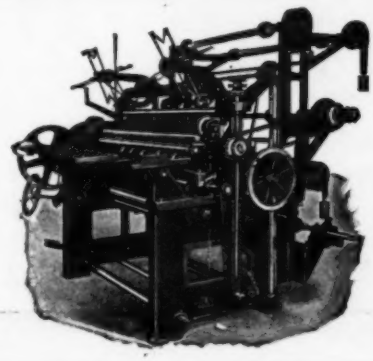

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Thermoid Rubber Co., Trenton, N. J.
United States Rubber Co., New York.

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Goodrich, B. F., Co., The, Akron, Ohio.

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Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Culp, George K., Inc., New York.
Denman-Myers Cord Tire Co., The, Cleveland, Ohio.
Firestone Tire & Rubber Co., Akron, Ohio.
Fisk Rubber Co., Chicopee Falls, Mass.
General Tire & Rubber Co., Akron, Ohio.
Goodrich, B. F., Co., The, Akron, Ohio.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
Indiana Rubber and Insulated Wire Co., Jonesboro, Ind.
Inland Rubber Co., Chicago, Ill.

Tires (Auto)—Continued.

McGraw Tire & Rubber Co., The, Cleveland, Ohio.
Miller, Chas. E., Anderson, Ind.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Parker Tire & Rubber Co., Indianapolis, Ind.
Pennsylvania Rubber Co., Jeannette, Pa.
Pirelli & Co., Milan, Italy.
Quaker City Rubber Co., Philadelphia, Pa.
Rubber Products Co., Barberton, O.
Thermoid Rubber Co., Trenton, N. J.
Tyer Rubber Co., Andover, Mass.

Tires—Baby Carriage.

North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.

Tires (Bicycle).

Fisk Rubber Co., Chicopee Falls, Mass.
Goodrich, B. F., Co., The, Akron, O.
Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.
Miller, Chas. E., Anderson, Ind.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Pennsylvania Rubber Co., Jeannette, Pa.

Tires (Motorcycle).

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Firestone Tire & Rubber Co., Akron, O.
Fisk Rubber Co., Chicopee Falls, Mass.
Goodrich, B. F., Co., The, Akron, O.
Miller, Chas. E., Anderson, Ind.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Pennsylvania Rubber Co., Jeannette, Pa.

Tires (Solid).

Firestone Tire & Rubber Co., Akron, O.
Fisk Rubber Co., Chicopee Falls, Mass.
General Tire & Rubber Co., Akron, O.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.

Tire Fabrics (See Cotton Goods in Raw Materials and Supplies).

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Essex Rubber Co., Trenton, N. J.
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Miller, Chas. E., Anderson, Ind.
Miola Rubber Mfg. Co., Inc., The, New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.

Valves, Tire.

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Wire Bead Braids (Flat).

National-Standard Co., Niles, Mich.

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Adamson Machine Co., The, Akron, O.
Akron Equipment Co., The, Akron, O.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Dunning & Boschert Press Co., Inc., The, Syracuse, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.
Southwark Foundry & Machine Co., Philadelphia, Pa.

Accumulators—Hydraulic. Cont.

Thropp's John E., Sons Co., Trenton, N. J.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.
Watson-Stillman Co., The, Aldene, N. J.
Williams F. & M. Co., Akron, Ohio.

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Birmingham Iron Foundry, Derby, Conn.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

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Allsteel Ridewell Tire & Rubber Co., The, Artyr Park, Dayton, Ohio.

Air Bags

Cupples Co., St. Louis, Mo.
Miller, Charles E., Anderson, Ind.

Air Compressors.

Miller, Chas. E., Anderson, Ind.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Williams F. & M. Co., Akron, Ohio.

Band Cutting Machines.

Adamson Machine Co., The, Akron, O.
Birmingham Iron Foundry, Derby, Conn.

Barometers, Hydrometers and Pyrometers.

Schaeffer & Budenberg Mfg. Co., The, Brooklyn, N. Y.
Taylor Instrument Cos., Rochester, N. Y.

For Complete Addresses See Advertisements—Index Pages 69-71

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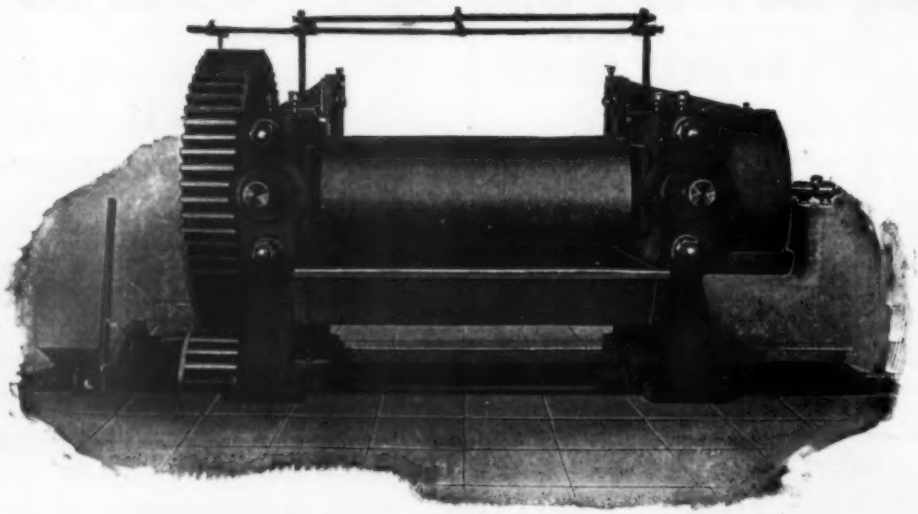

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Farrel Foundry & Machine Co., Ansonia, Conn.
Hydraulic Press Mfg. Co., The, Mount Gilead, Ohio.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Williams Foundry & Machine Co., The, Akron, Ohio.

Bead Trimmers.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Belt Folding Machines.
Birmingham Iron Foundry, Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.

Belt Slitters.
Birmingham Iron Foundry, Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.

Belt Stretchers.
Birmingham Iron Foundry, Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Hoggson & Pettis Mfg. Co., New Haven, Conn.

Bias Cutters.
Birmingham Iron Foundry, Derby, Conn.

Boilers.
Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William R., & Sons Co., Trenton, N. J.

Braiders.
New England Butt Co., Providence, R. I.

Brushing Machines and Brushes.
Curtis & Marble Mach. Co., Worcester, Mass.
Cleveland-Osborn Mfg. Co., Cleveland, Ohio.
Osborn Mfg. Co., The, Cleveland, Ohio.

Brushes, Rotary Wire.
Cleveland-Osborn Manufacturing Co., Cleveland, Ohio.
Osborn Mfg. Co., The, Cleveland, Ohio.

Buffing Brushes.
Cleveland Osborn Mfg. Co., Cleveland, Ohio.
Osborn Mfg. Co., The, Cleveland, Ohio.

Buffing Machines.
Excelsior Tool & Machine Co., East St. Louis, Mo.
Williams Foundry & Machine Co., The, Akron, Ohio.

Burrs—Light Steel for Rubber Heels.
Independent Nail & Packing Co., Bridgewater, Mass.
Sessions, J. H., & Son, Bristol, Conn.
Ward & Andre, Brockton, Mass.

Calenders.
Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Black Rock Mfg. Co., Bridgeport, Conn.
Bridge, David, & Co., Castleton, Manchester, Eng.
Farrel F. & M. Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Calenders—Brake Lining.
Black Rock Mfg. Co., The, Bridgeport, Conn.

Calender Screw-Down — Motor Driven.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.

Casting Models.
College Point Rubber Mold & Engraving Co., College Point, L. I., N. Y.

Castings.
Adamson Machine Co., The, Akron, O.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Excelsior Tool & Machine Co., E. St. Louis, Ill.
Farrel F. & M. Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.
Williams F. & M. Co., Akron, Ohio.

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Butterworth, H. W., & Sons Co., Philadelphia, Pa.

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Block.
Drive.
Power Transmission.
Silent (Rocker-Joint).
Sprocket Wheel.
Link-Belt Company, Chicago, Ill.
Morse Chain Co., Ithaca, N. Y.

Chemical Apparatus.
Devine, J. P., Co., Buffalo, N. Y.

Chemical Plants.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.

Chucks—Lathe and Drill.
Hoggson & Pettis Mfg. Co., New Haven, Conn.

Churns and Cement Making Machines.
Day Co., J. H., Cincinnati, Ohio.
East Iron & Machine Co., Lima, Ohio.
Miller, Chas. E., Anderson, Ind.

Cloth Dryers.
Banner Machine Co., The, Columbiana, Ohio.
Birmingham Iron Fdry., Derby, Conn.
Butterworth, H. W., & Sons Co., Philadelphia, Pa.
Farrel F. & M. Co., Ansonia, Conn.
Textile-Finishing Machinery Co., Providence, R. I.

Clutch Brakes—Pneumatic.
Birmingham Iron Foundry, Derby, Conn.

Clutches—Friction.
Allen Machine Co., Erie, Pa.
Birmingham Iron Fdry., Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Link-Belt Company, Chicago, Ill.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.
Williams F. & M. Co., Akron, Ohio.

Compound and Tote Boxes.
Carli's, Chas. W., Sons, Trenton, N. J.
Diamond State Fiber Co., Bridgeport, Pa.
Ornamental Iron Work Co., Akron, Ohio.
Portage Iron & Wire Co., Akron, Ohio.

Condensers.
Buffalo Fdy. & Mach. Co., Buffalo, N. Y.

Conduits—Underground Steam or Hot Water Pipes
Ric-wil Co., The, Cleveland, Ohio.

Controllers—Electrical.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Controllers—Temperature.
Taylor Instrument Cos., Rochester, N. Y.

Cooling Tables.
Ornamental Iron Work Co., Akron, Ohio.

Counters.
Schaeffer & Budenberg Mfg. Co., The, Brooklyn, N. Y.

Couplings.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Birmingham Iron Foundry, Derby, Conn.
Dixon Valve & Coupling Co., Philadelphia, Pa.

Couplings—Flexible and Rigid.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Smith & Serrell, Newark, N. J.

Coverings—Underground Steam or Hot Water Pipes
Ric-wil Co., The, Cleveland, Ohio.

Crackers.
Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Cranes.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Link-Belt Company, Chicago, Ill.
Southwark Foundry & Machine Co., Philadelphia, Pa.

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UNEXCELLED IN FINENESS AND UNIFORMITY

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Specially prepared to meet the requirements of rubber manufacturers, and now being used by many of the largest makers of rubber goods.

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Zinc Oxide—Red, Green & White Seal
Genuine French Talc

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RUBBER BUYERS' DIRECTORY—Continued.

Cranes—Hydraulic.
Watson-Stillman Co., The, Aldene, N. J.

Cranes—Locomotive.
Utility Manufacturing Co., Cudahy, Ohio.
Link-Belt Company, Chicago, Ill.

Cutters—Crude Rubber.
Peerless Machine Co., Racine, Wis.

Cutters—Scrap.
Taylor, Stiles & Co., Riegelsville, N. J.

Cutters—Tire Section.
Adamson Machine Co., The, Akron, Ohio.

Cutting and Slitting.
Reichel & Drews, Chicago, Ill.

Devulcanizers.
Biggs Boiler Works Co., The, Akron, O.

Die Sinking and Engraving.
College Point Rubber Mold & Engraving Co., College Point, L. I., N. Y.

Die Blocks.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.

Dies.
Akron Equipment Co., The, Akron, O.
Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Die Sinking & Machine Co., The, Akron, Ohio.
Excelsior Tool & Machine Co., East St. Louis, Mo.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Housatonic Mach. & Tool Co., Bridgeport, Conn.
Knox, Jos. E., & Co., Inc., Lynn, Mass.
Mechanical Mold & Machine Co., The, Akron, Ohio.
Reynolds Machine Co., The, Massillon, Ohio.
Ward & Andre, Brockton, Mass.
Williams F. & M. Co., Akron, Ohio.

Dipped Goods Forms (Porcelain).
Colonial Sign & Insulator Co., Akron, Ohio.
Seville Porcelain Co., Seville, Ohio.

Dipping Machines and Racks.
Ornamental Iron Work Co., Akron, Ohio.

Doubling Machines.
Birmingham Iron Fdry., Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Draft Gages.
Schaeffer & Budenberg Mfg. Co., The, Brooklyn, N. Y.

Drives—Mill
Birmingham Iron Foundry, Derby, Conn.
Farrell Foundry & Machine Co., Ansonia, Conn.
Fawcus Machine Co., Pittsburgh, Pa.

Drives—Silent Chain.
Link-Belt Company, Chicago, Ill.
Morse Chain Co., Ithaca, N. Y.

Dryers—Vacuum.
Buffalo Fdy. & Mach. Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.

Drying and Processing.
Carrier Engineering Corp., New York.
Hunter Dry Kiln Co., Indianapolis, Ind.

Drying Machines.
Allen Machine Co., Erie, Pa.
American Process Co., New York.
Birmingham Iron Foundry, Derby, Conn.
Bridge, David, & Co., Castleton, Manchester, Eng.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Carrier Engineering Corp., New York.
Devine, J. P., Co., Buffalo, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Hunter Dry Kiln Co., Indianapolis, Ind.
Textile-Finishing Machinery Co., Providence, R. I.

Duck Slitters.
Birmingham Iron Foundry, Derby, Conn.

Electrical Safety Switches.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Elevators and Conveyors.
Link-Belt Company, Chicago, Ill.

Embossing Calenders.
Allen Machine Co., Erie, Pa.
Birmingham Iron Fdry., Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Textile-Finishing Machinery Co., Providence, R. I.

Engineering Devices.
Yarnall-Waring Co., Philadelphia, Pa.

Engines—Steam.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William R., & Sons Co., Trenton, N. J.

Engraving Rolls.
Birmingham Iron Fdry., Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Hoggson & Pettis Mfg. Co., New Haven, Conn.

Engraving—Tire Molds.
Akron Equipment Co., The, Akron, O.
Claflin Engineering Co., Lancaster, Ohio.
Cleveland Rubber Mold Foundry & Machine Co., The, Cleveland, Ohio.
Die Sinking & Machine Co., The, Akron, Ohio.
Williams Foundry & Machine Co., The, Akron, Ohio.

Evaporators.
Devine, J. P., Co., Buffalo, N. Y.
Buffalo Foundry & Machine Co., Buffalo, New York.

Eyeletting Machines.
United Shoe Machinery Corporation, Boston, Mass.

Fittings.
Utility Manufacturing Co., Cudahy, Wis.

Fittings—Hydraulic Pipe.
Smith & Serrell, Newark, N. J.
Watson-Stillman Co., The, Aldene, N. J.

Gages.
Bristol Co., The, Waterbury, Conn.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Hydraulic Press Mfg. Co., The, Mount Gilead, Ohio.
Schaeffer & Budenberg Co., The, Brooklyn, N. Y.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Taylor Instrument Cos., Rochester, N. Y.

Gages—Thickness.
Ames, B. C., & Co.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Randall, Frank E., Waltham, Mass.

Gear Cutting.
Akron Gear & Engineering Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Fawcus Machine Co., Pittsburgh, Pa.

Gears.
Spring.
Silent Chain.
Compensating.

Akron Gear & Engineering Co., Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Fawcus Machine Co., Pittsburgh, Pa.
Link-Belt Company, Chicago, Ill.
Morse Chain Co., Ithaca, N. Y.

Gears—Helical.
Nuttall, R. D., Co., Pittsburgh, Pa.

For Complete Addresses See Advertisements—Index Pages 69-71

CABLE ADDRESS
"REDSONDER, NEW YORK"
LIEBER'S
A. B. C. 5TH EDITION AND
PRIVATE CODES

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HAROLD H. HENDERSON
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CHICAGO, ILL.
F. R. HENDERSON & CO.

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MANHASSET

TRADE MARK REG. U.S. PAT. OFF.

The Fabric for Endurance

MANHASSET MFG. COMPANY, Providence, R. I.

THE DAVIDSON STANDARD
SERVICE SAVINGS SATISFACTION
IT'S NAILED TO THE MAST.
DAVIDSON RUBBER CO. BOSTON, MASS.

Davidson Rubber Company
Boston, Mass.

Specialists in the manufacture of
Fountain Syringes, Water Bottles and Nipples

RAINCOATS, BLANKETS, PONCHOS, etc.

The Quality Which Gives Service Under all Conditions.

Clifton Manufacturing Co.
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You CAN MANUFACTURE WEATHER
Humidification-Dehumidification
Ventilation-Purification-Drying
Carrier Engineering Corporation
39 Cortlandt Street-New York
Boston Buffalo Philadelphia Chicago

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CARBON BLACK
LITHOPONE
ZINC OXIDE

John S. Lamson & Bro., Inc.
100 JOHN STREET NEW YORK, N. Y.

RUBBER BUYERS' DIRECTORY—Continued.

Gears—Reduction.

Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Fawcus Machine Co., Pittsburgh, Pa.

Grinders—See Mixers.

Hangers.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Birmingham Iron Fdry., Derby, Conn.
Fawcus Machine Co., Pittsburgh, Pa.
Farrel F. & M. Co., Ansonia, Conn.

Heater Presses.

Adamson Machine Co., The, Akron, Ohio.
Akron Equipment Co., The, Akron, O.
Allen Machine Co., Erie, Pa.
Hydraulic Press & Mfg. Co., The, Mt. Gilead, Ohio.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Williams Foundry & Machine Co., The, Akron, Ohio.

Hoists.

Link-Belt Company, Chicago, Ill.
Utility Mfg. Co., Cudahy, Wis.

Hoists—Electric.

Link-Belt Company, Chicago, Ill.

Hoists—Hydraulic.

Hydraulic Press Mfg. Co., The, Mount Gilead, Ohio.
Watson-Stillman Co., The, Aldene, N. J.

Hose Machines.

Birmingham Iron Foundry, Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
New England Butt Co., Providence, R. I.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Hose Wiring Machines.

Adamson Machine Co., The, Akron, Ohio.
Bridge, David, & Co., Castleton, Manchester, England.

Hydraulic Valves.

Dunning & Boschert Press Co., Inc., The, Syracuse, N. Y.
Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.
Pittsburgh Valve Foundry & Construction Co., Pittsburgh, Pa.
Yarnall-Waring Co., Philadelphia, Pa.

Insulating Machinery

Adamson Machine Co., The, Akron, O.
Allen Machine Co., Erie, Pa.
Biggs Boiler Works Co., The, Akron, Ohio.
Housatonic Machine & Tool Co., Bridgeport, Conn.
New England Butt Co., Providence, R. I.
Royle, John, & Sons, Paterson, N. J.

Iron and Steel.

Sheets, Bars, Cold Rolled, Drawn and Turned, Structural, Etc.
Brown-Wales Co., Boston, Mass.

Jar Ring and Washer Cutting Machines.

Black Rock Mfg. Co., Bridgeport, Conn.

Laboratory Apparatus.

Banner Machine Co., The, Columbiana, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Bristol Co., The, Waterbury, Conn.
Schaeffer & Budenberg Co., The, Philadelphia, Pa.
Taylor Instrument Cos., Rochester, N. Y.

Laboratory Machinery.

Banner Machine Co., The, Columbiana, Ohio.
Biggs Boiler Works Co., The, Akron, Ohio.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.
Farrel Foundry & Machine Co., Ansonia, Conn.
Sieverkropp Engine Co., Racine, Wisc.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Lathes—Hard Rubber.

Adamson Machine Co., The, Akron, O.

Lathes—Jar Ring.

Adamson Machine Co., The, Akron, O.
Birmingham Iron Foundry, Derby, Conn.
Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William R., & Sons' Co., Trenton, N. J.

Locomotive Cranes.

Link-Belt Company, Chicago, Ill.
Utility Manufacturing Co., Cudahy, Wis.

Machinery, Transmission (Power).

Birmingham Iron Foundry, Derby, Conn.
Farrell Foundry & Machine Co., Ansonia, Conn.
Morse Chain Co., Ithaca, N. Y.

Machinists' Tools.

Everhard Mfg. Co., The, Canton, Ohio.
Hoggson & Pettis Mfg. Co., New Haven, Conn.

Magnetic Clutches and Brakes.

Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.

Mandrels—Tube Splicing.

Carli's, Chas. W., Sons, Trenton, N. J.
Williams Foundry & Machine Co., The, Akron, Ohio.

Mandrels—Sherardize.

Biggs Boiler Works Co., The, Akron, O.
New Haven Sherardizing Co., New Haven, Conn.

Masticators.

Birmingham Iron Foundry, Derby, Conn.
East Iron & Machine Co., The, Lima, Ohio.
Farrel Foundry & Machine Co., Ansonia, Conn.

Measuring Rolls.

Curtis & Marble Mach. Co., Worcester, Mass.

Mill Room Cooling Tables.

Ornamental Iron Work Co., Akron, Ohio.

Mixers.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Biggs Boiler Works Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Day, J. H., Co., Cincinnati, Ohio.
East Iron & Machine Co., The, Lima, Ohio.
Farrel Foundry & Machine Co., Ansonia, Conn.
Miller, Chas. E., Anderson, Ind.
Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William R., & Sons Co., Trenton, N. J.
Vaughn Machinery Co., Cuyahoga Falls, Ohio.

Mixers—Automatic.

Birmingham Iron Foundry, Derby, Conn.

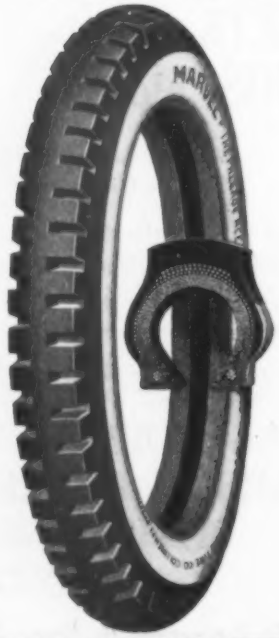
Molds.

Adamson Machine Co., The, Akron, O.
Akron Equipment Co., The, Akron, Ohio.
Akron Gear & Engineering Co., Akron, Ohio.
Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Akron Rubber Mold and Machine Co., Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Brockton Tool Co., Brockton, Mass.
Claflin Engineering Co., Lancaster, Ohio.
Die Sinking & Machine Co., The, Akron, Ohio.

For Complete Addresses See Advertisements—Index Pages 69-71

MARVEL

THE MILEAGE ACE



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COLUMBIANA, OHIO

An Old Name With A New Service

The same earnest endeavor, that has been behind the Dexter mechanical devices for years, is being used in the production of Dexco Tire Flaps.

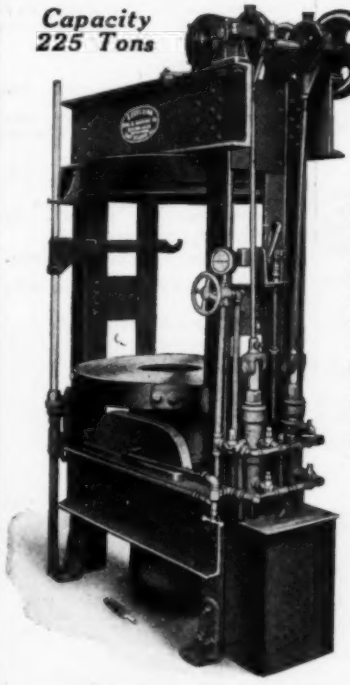
Being made on the most modern equipment available, from high-grade material, the smaller Tire Manufacturers are assured of a dependable source of supply.

Just figure your flap cost now and then let us show you how we can supply you with a high-grade flap—either finished sizes or long lengths—cheaper than you can make them.

DEXTER RUBBER MFG. CO.
182 Greenwich Ave.
GOSHEN NEW YORK

EXCELSIOR Tire Applying PRESS

Capacity 225 Tons



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Recommended and used by the largest Tire Mfrs. as the Standard Tire Press.

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Reclaimed Rubber Manufacturers

BRANDS	FOR USE IN
"HUDSON"	Hard Rubber Goods, Etc.
"POTOMAC"	Insulated Wire, Etc.
"POTOMAC A"	Hospital Sheeting, Soles, Heels, Etc.
"MERRIMAC"	Molded Goods and Insulated Wire, Etc.
"DELAWARE"	Druggist Sundries, Etc.
"ST. LAWRENCE"	Ins. Wire, Auto Tire Friction, Etc.

All "NEARPARA" Stocks uniform and contain a high percentage of rubber

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TRENTON, N. J.

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30% LITHOPONE

OXIDE OF ZINC

Rubber Makers Litharge

Rubber Makers Hydro-Carbon

ANTIMONY BARYTES

WHITING MAGNESIA

OXIDE OF IRON

ACCELERATORS

TANKS TANKS TANKS

We manufacture galvanized dipping tanks, storage tanks, cement cans, etc., to your specifications and drawings. Write us for further information and prices.

J. C. HEIFNER MFG. CO.

Ashland, Ohio

MACHINERY AND SUPPLIES FOR RUBBER MILLS

Molds—Continued.

Donnelly Machine Co., Brockton, Mass.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Housatonic Mach. & Tool Co., Bridgeport, Conn.
Kuhlke Machine Co., Akron, Ohio.
Mahlow & Wyckoff, Trenton, N. J.
Mechanical Mold & Machine Co., The, Akron, Ohio.
Miller, Chas. E., Anderson, Ind.
Thropp's, John E., Sons Co., Trenton, N. J.
Ward & Andre, Brockton, Mass.
Williams Foundry & Machine Co., Akron, O.

Molds—Engraving.

Claflin Engraving Co., Lancaster, O.
Williams Foundry & Machine Co., The, Akron, Ohio.

Molds—Heels and Soles.

Akron Gear & Engineering Co., Akron, Ohio.
Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Brockton Tool Co., Brockton, Mass.
College Point Rubber Mold & Engraving Co., College Point, L. I., N. Y.
Die Sinking & Machine Co., The, Akron, Ohio.
Donnelly Machine Co., Brockton, Mass.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Mechanical Mold & Machine Co., Akron, Ohio.
Ward & Andre, Brockton, Mass.

Molds—Druggists' Sundries.

Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
College Point Rubber Mold & Engraving Co., College Point, L. I., N. Y.
Die Sinking & Machine Co., The, Akron, Ohio.
Donnelly Machine Co., Brockton, Mass.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Mechanical Mold & Machine Co., Akron, Ohio.

Molds—Mechanical Rubber Goods.

Adamson Machine Co., Akron, Ohio.
Akron Gear & Engineering Co., The, Akron, Ohio.
Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Donnelly Machine Co., Brockton, Mass.
Mechanical Mold & Machine Co., Akron, Ohio.

Molds and Cores—Tires.

Adamson Machine Co., The, Akron, O.
Akron Equipment Co., Akron, Ohio.
Akron Gear & Engineering Co., Akron, O.
Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Akron Rubber Mold & Machine Co., Akron, O.
Akron Standard Mold Co., Akron, Ohio.
Banner Machine Co., The, Columbiana, Ohio.
Claflin Engineering Co., Lancaster, Ohio.
Cleveland Rubber Mold Foundry & Machine Co., The, Cleveland, Ohio.
College Point Rubber Mold & Engraving Co., College Point, L. I., N. Y.
De Matha Bros., Inc., Garfield, N. J.
Frans Foundry & Machine Co., Akron, Ohio.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Kuhlke Machine Co., Akron, Ohio.
Mahlow & Wyckoff, Trenton, N. J.
Miller, Charles E., Anderson, Ind.
Reynolds Machine Co., The, Masillon, Ohio.
Thropp's, John E., Sons Co., Trenton, N. J.
Williams Foundry & Machine Co., Akron, Ohio.

Motors.

Electric Motor & Repair Co., The, Akron, Ohio.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Pattern Makers.

Adamson Machine Co., The, Akron, O.
Excelsior Tool & Machine Co., East St. Louis, Mo.

Pillow Blocks.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Birmingham Iron Fdry., Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Plantation Machinery.

Birmingham Iron Foundry, Derby, Conn.
Bridge, David, & Co., Castleton, Eng.
Farrel Foundry & Machine Co., Ansonia, Conn.
Shaw, Francis, & Co., Ltd., Manchester, Eng.

Plantation Supplies.

Bridge, David, & Co., Castleton, Eng.

Presses—Packing.

Black Rock Mfg. Co., The, Bridgeport, Conn.

Presses—Vulcanizing.

Adamson Machine Co., The, Akron, Ohio.
Akron Equipment Co., The, Akron, O.
Akron Rubber Mold & Machine Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William B., & Sons' Co., Trenton, N. J.

Presses—Vulcanizing—Cont'd.

Sieverkropp Engine Co., Racine, Wisc.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.
Watson-Stillman Co., The, Aldene, N. J.
Williams Foundry & Machine Co., Akron, O.

Pumps.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.
Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.
Myers, F. E., & Bro., Ashland, O.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Watson-Stillman Co., The, Aldene, N. J.

Pumps—Centrifugal.

Southwark Foundry & Machine Co., Philadelphia, Pa.

Pumps—Vacuum.

Buffalo Fdy. & Mach. Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.

Racks and Frames.

Carll's, Charles W., Sons, Trenton, N. J.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Portage Iron & Wire Co., Akron, Ohio.

Reclaiming Machinery.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
American Process Co., New York.
Biggs Boiler Works Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Buffalo Fdy. & Mach. Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.

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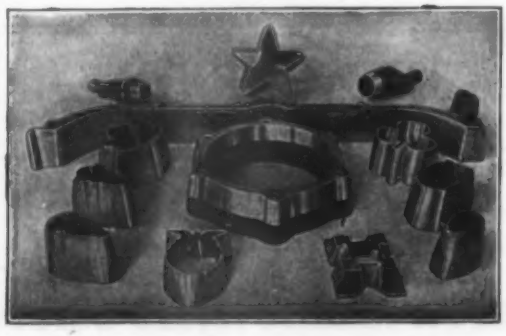
Cutting Dies
for all purposes



Any Size
Any Style

Tools of Quality

Ball Bearing and Plain Bearing

Rollers and Stitchers for the Rubber Trade

Iron **MOLDS** *Steel*

We manufacture Molds for Heels, Soles, Water Bottles, Nipples, Grips and Other Mechanical Goods

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The Equitable Trust Building, Madison Ave. and 45th St., New York City

Cord Yarn and Cord Fabric for Cord Tires

All yarn and fabric constructions, in Peeler, Egyptian and Sea Island

We are expert in making

MOLDS for Combs and Special Comb Manufacturing Machinery, Molds for Auto Tires, Water Bags, Heels, Soles, Fountain Syringes, Fountain Pens and Golf Balls.

HUBS for Gun Butt Plates and Pistol Scale.

MEDALLION Letter Cutting and Stamping.

MODELS for Casting Soft Metal Molds for Pipe Stems, Fountain Syringes, Insulating Specialties, Magneto Distributing Blocks, Radiator Caps, Knobs and Inkstands.

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Carbon Tetrachloride
Caustic Soda
Heavy Calcined Magnesia
"Carrara" Filler
and Other Rubber Specialties

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46 Cliff Street ESTABLISHED 1816 New York

BRANCHES: Chicago, Cleveland, Boston and Philadelphia
FACTORIES: Niagara Falls, Jersey City, Murphysboro, Ill., and Owego, N. Y.

RUBBER MACHINERY

An Encyclopedia of Machines Used in Crude Rubber Washing, Drying, Preparing of Ingredients, Mixing, Preparing of Fabrics, Calendering; Vulcanizers, Presses and Molds General, Spreaders, Tubing Machines; Cements; Reclaimed Rubber; Extracting Machines for Wild Rubber; Laboratory Equipment; Deresination, etc., etc.

By HENRY C. PEARSON

PRICE $6.00 PREPAID

THE INDIA RUBBER WORLD

25 West 45th Street New York

TOWAR MILLS

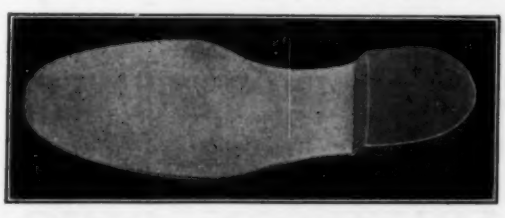
Tire Fabrics
Belt and Hose Ducks

TOWAR COTTON MILLS
Niles, Mich.
TOWAR TEXTILE MILLS
Toledo, Ohio

MOLDS

A General Line of Steel Molds and Dies for Mechanical and Molded

RUBBER GOODS



We Specialize in

SOLE AND HEEL MOLDS

WE ALSO MAKE **HEEL BURRS**

WARD & ANDRE *Mold Makers and Die Sinkers* 71 Field St., Brockton, Mass.

MACHINERY AND SUPPLIES FOR RUBBER MILLS—Continued

Reclaiming Machinery—Cont'd.

Farrel F. & M. Co., Ansonia, Conn.
Housatonic M. & T. Co., Bridgeport, Conn.
Taylor, Stiles & Co., Riegelsville, N. J.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Reclaiming Water Separators.

American Process Co., New York City.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Recording Instruments.

For Pressure and Temperature.

Bristol & Co., Waterbury, Conn.
Randall, Frank E., Waltham, Mass.
Schaeffer & Budenberg Co., The, Brooklyn, N. Y.
Taylor Instrument Cos., Rochester, N. Y.
Yarnall-Waring Co., Philadelphia, Pa.

Refiners.

Birmingham Iron Foundry, Derby, Conn.

Repair Equipment for Rubber Footwear.

Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Miller, Chas. E., Anderson, Ind.

Riveters.

Southwark Foundry & Machine Co., Philadelphia, Pa.
Watson-Stillman Co., The, Aldene, N. J.

Rivets.

Sessions, J. H., & Son, Bristol, Conn.

Rollers and Stitchers—Hand.

Everhard Mfg. Co., The, Canton, Ohio.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Miller, Chas. E., Anderson, Ind.
Wellman Co., Medford, Mass.

Rolls—Chilled.

Akron Rubber Mold & Machine Co., Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Curtis & Marble Mch. Co., Worcester, Mass.

Rotary Wire Wheels.

Cleveland Osborn Mfg. Co., Cleveland, Ohio.
Osborn Mfg. Co., The, Cleveland, Ohio.

Rubber Covering Machines.

New England Butt Co., Providence, R. I.

Rubber Scrap Cutters.

Taylor, Stiles & Co., Riegelsville, N. J.

Sewing Machines.

Curtis & Marble Mch. Co., Worcester, Mass.

Shafting.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Fdry., Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Sherardizing.

New Haven Sherardizing Co., New Haven, Conn.

Shoe Cars and Sticks.

Birmingham Iron Foundry, Derby, Conn.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Ornamental Iron Work Co., Akron, Ohio.
Wellman Co., Medford, Mass.

Shifters—Dry.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Day, J. H. Co., Cincinnati, Ohio.

Skiving Machines.

Allen Machine Co., Erie, Pa.
United Shoe Machinery Corporation, Boston, Mass.

Slitting and Re-Winding Machines.

Cameron Machine Co., Brooklyn, N. Y.

Solvent Recovery Apparatus.

Benzine Condensation Co., New York.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.

Special Machinery.

Akron Equipment Co., The, Akron, O.
Akron Gear & Engineering Co., The, Akron, Ohio.
Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Akron Rubber Mold & Mach. Co., Akron, Ohio.
Banner Machine Co., The, Columbiana, Ohio.
Biggs Boiler Works Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Black Rock Mfg. Co., Bridgeport, Conn.
Cleveland Rubber Mold Foundry & Machine Co., The, Cleveland, Ohio.
Farrel Foundry & Machine Co., Ansonia, Conn.
Franz Foundry & Machine Co., Akron, Ohio.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Kuhlke Machine Co., Akron, Ohio.
Williams Foundry & Machine Co., The, Akron, Ohio.
Wills, Arthur Jackson, North Brookfield, Mass.

Sprayers.

Myers, F. E., & Bro., Ashland, Ohio.

Spreaders.

Adamson Machine Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
New England Butt Co., Providence, R. I.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Sprockets.

Spring Silent Chain. Compensating.
Link-Belt Company, Chicago, Ill.
Morse Chain Co., Ithaca, N. Y.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.

Steel Stampings.

Independent Nail & Packing Co., Bridgewater, Mass.
Sessions, J. H., & Son, Bristol, Conn.

Steel Stamps.

Hoggson & Pettis Mfg. Co., New Haven, Conn.
Wellman Co., Medford, Mass.

Stitchers.

Akron Rubber Mold & Machine Co., Akron, Ohio.
Hoggson & Pettis Mfg. Co., New Haven, Conn.

Stock Bins and Shelves

Carli's, Chas. W., Sons, Trenton, N. J.
Ornamental Iron Work Co., Akron, O.
Portage Iron & Wire Co., Akron, Ohio.

Stock Shells.

Carli's, Chas. W., Sons, Trenton, N. J.
Gammeter, W. F., Co., The, Cadiz, Ohio.
Ornamental Iron Works Co., Akron, Ohio.

Strip Cutters.

Birmingham Iron Foundry, Derby, Conn.
Cameron Machine Co., Brooklyn, N. Y.
New England Butt Co., Providence, R. I.

Stripping Tables.

Akron Standard Mold Co., Akron, Ohio.
Williams Foundry & Machine Co., The, Akron, Ohio.

Swing Joints.

Adamson Machine Co., The, Akron, Ohio.
Hydraulic Press Mfg. Co., The, Mount Gilead, Ohio.
Williams, Franklin, Inc., New York.

Tables—Cooling.

Ornamental Iron Work Co., Akron, Ohio.
Portage Iron & Wire Co., Akron, Ohio.

Tables—Cutting.

Portage Iron & Wire Co., Akron, Ohio.

Tachometers.

Schaeffer & Budenberg Mfg. Co., The, Brooklyn, N. Y.

Tanks, Storage—Oil and Gasoline.

Biggs Boiler Works Co., Akron, Ohio.
Heifner, J. C., Mfg. Co., Ashland, Ohio.

Testing Machines.

Scott, Henry L., & Co., Providence, R. I.

Thermometers.

Schaeffer & Budenberg Mfg. Co., The, Brooklyn, N. Y.
Taylor Instrument Cos., Rochester, N. Y.

Tire Building Equipment.

Akron Equipment Co., The, Akron, O.
Banner Machine Co., The, Columbiana, Ohio.
Adamson Machine Co., The, Akron, Ohio.
Akron Rubber Mold & Machine Co., Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Fdy., Derby, Conn.
Carli's, Chas. W., Sons, Trenton, N. J.
Farrel Foundry & Machine Co., Ansonia, Conn.
Thropp's, John E., Sons So., The, Trenton, N. J.
Williams Fdy. & Mach. Co., Akron, O.

Tire Building Machines.

Banner Machine Co., The, Columbiana, Ohio.
Carli's, Chas. W., Sons, Trenton, N. J.

Tire Building Machines—Cont'd.

Herman Tire Building Machine Co., The, Columbus, Ohio.
Thropp's, John E., Sons Co., The, Trenton, N. J.

Tire Building Stands.

Williams Foundry & Machine Co., The, Akron, Ohio.

Tire Fabric Puller.

Reichel & Drews, Chicago, Ill.

Tire Lasts.

Miller, Chas. E., Anderson, Ind.
Williams Foundry & Machine Co., The, Akron, Ohio.

Tire Machine Drums.

Gammeter, W. F., Co., The, Cadiz, Ohio.

Tire Mold Engraving Machine.

Gorton, George, Machine Co., Racine, Wis.

Tire Presses.

Adamson Machine Co., The, Akron, Ohio.
Akron Equipment Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Dunning & Boschert Press Co., Inc., The, Syracuse, N. Y.
Excelsior Tool & Machine Co., East St. Louis, Mo.
Farrel Foundry & Machine Co., Ansonia, Conn.
Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.
Miller, Chas. E., Anderson, Ind.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Watson-Stillman Co., The, Aldene, N. J.
Williams Foundry & Machine Co., The, Akron, Ohio.

Tire Rebuilding and Repair Equipment.

Akron Rubber Mold & Mach. Co., The, Akron, O.
Biggs Boiler Works Co., The, Akron, O.
Franz Foundry & Machine Co., Akron, Ohio.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Miller, Chas. E., Anderson, Ind.
Williams, F. & M. Co., Akron, Ohio.

Tire Vulcanizing Presses.

The Adamson Machine Co., Akron, O.
Akron Equipment Co., The, Akron, O.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Williams, F. & M. Co., Akron, Ohio.

Tire Wrapping Machines.

Adamson Machine Co., The, Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Banner Machine Co., The, Columbiana, Ohio.
Miller, Chas. E., Anderson, Ind.
Pierce Wrapping Mach. Co., Chicago, Ill.
Thropp's, John E., Sons Co., Trenton, N. J.

For Complete Addresses See Advertisements—Index Pages 69-71

The Franz Foundry & Machine Company

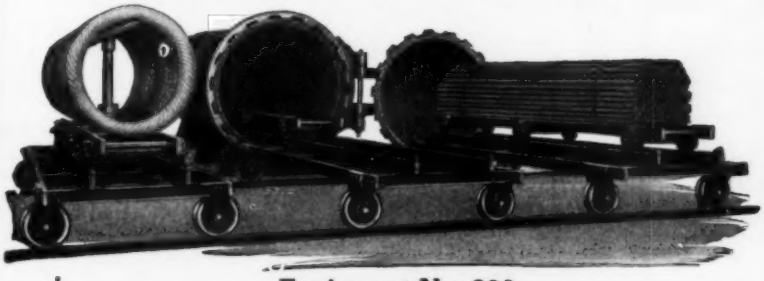
AKRON, OHIO

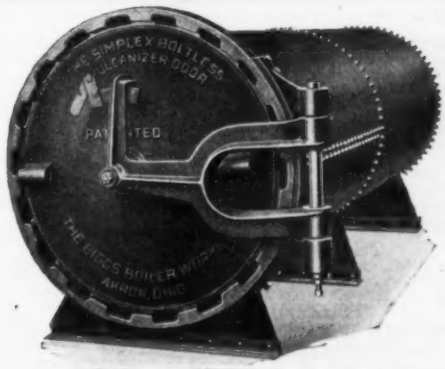
MOLDS—SPECIAL MACHINERY—CORES—TIRE REPAIR EQUIPMENT

UNUSUALLY WELL ADAPTED FOR TREAD ENGRAVING

Factory - - - - BARBERTON, OHIO

SAFETY and EFFICIENCY combined
by using the
SIMPLEX BOLTLESS VULCANIZER DOOR
on Horizontal and Vertical
VULCANIZERS





Equipment No. 800

illustrates our Standard Horizontal Vulcanizer, Simplex equipped, with inside track, car, two No. 600 outside transfer trucks, and special No. 44 inside cars. This makes an ideal equipment for handling inner tubes on straight poles as well as on circular mandrels, wrapped tread casings, etc.

We have on hand for immediate shipment a complete stock of standard and oversize polished and sherardized Inner Tube Mandrels.

WRITE FOR DESCRIPTIVE CATALOG NO. 17

Exclusive Features of the "Simplex Door

Safety and tightness of door is not subject to manual operation, as the entire load is automatically supported by heavy cast steel lugs. The locking mechanism is visible. A safety latch is provided so the door cannot be opened or closed with lugs out of relation.. Accepted by The Hartford Steam Boiler Inspection & Insurance Company.

Absolutely self-contained, door operates on its own hinges. No counterweights or mechanical operating device required.

Free from annoying adjustments. Heavily designed, made of cast steel throughout. Will last indefinitely.

EFFICIENCY: Door can be opened and closed in less than thirty seconds. Fully guaranteed in every respect.

"Gasoline and Oil Storage Tanks"

THE BIGGS BOILER WORKS CO., Case Ave. & B. & O. R. R., AKRON, OHIO

"Biggs" Extra Heavy Oil and Gasoline Storage Tanks

Write for Price-Lists covering 166 standard sizes.

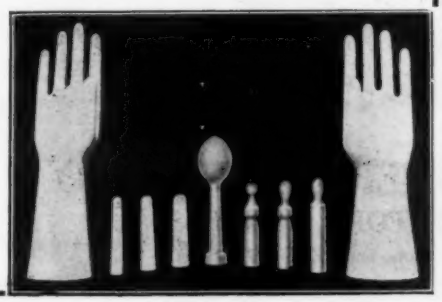
THE BIGGS BOILER WORKS CO., Tank Dept., Akron, O.

S. P. Vitrified Porcelain Forms

For all Rubber Dipped Goods. Manager's experience 18 years.

Write us your wants

SEVILLE PORCELAIN CO.
Seville, O.



ACCELERATORS

HEXAMETHYLENETE-TRAMINE—Powder
Under Patent No. 1149580-1126429

ALDEHYDE AMMONIA
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FORMALDEHYDE—Aniline

THIOCARBANILID

AND

HIGH-GRADE RUBBER MAKERS CHEMICALS

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GOLDEN
CRIMSON
VERMILION
15-17%
FREE SULPHUR

THE
ROESSLER & HASSLACHER CHEMICAL CO.
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Chicago
Boston
New Orleans
Cleveland
Philadelphia
Trenton
San Francisco
Cincinnati
Kansas City
Pittsburgh

MACHINERY AND SUPPLIES FOR RUBBER MILLS—Continued

Transmission (Silent) Chains.
Link-Belt Company, Chicago, Ill.
Morse Chain Co., Ithaca, N. Y.

Transmission Machinery.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Morse Chain Co., Ithaca, N. Y.
Nuttall, R. D., Co., Pittsburgh, Pa.

Tread Making Machines.
Birmingham Iron Foundry, Derby, Conn.

Trimmers.
Morris, T. W., Chicago, Ill.
Wills, Arthur Jackson, North Brookfield, Mass.

Trucks
Portage Iron & Wire Co., Akron, Ohio.

Tube Wrapping Machines.
Akron Rubber Mold & Machine Co., Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Black Rock Mfg. Co., The, Bridgeport, Conn.
Williams Foundry & Machine Co., The, Akron, Ohio.

Tubing Machines.
Adamson Machine Co., Akron, O.
Akron Rubber Mold & Machine Co., Akron, O.
Allen Machine Co., Erie, Pa.
Housatonic Mach. & Tool Co., Bridgeport, Conn.
Royle, John, & Sons, Paterson, N. J.
Williams Foundry & Machine Co., Akron Ohio.

Turbines—Steam.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Southwark Foundry & Machine Co., Philadelphia, Pa.

Vacuum Cloth Impregnating Equipment.
Banner Machine Co., The, Columbiana, Ohio.

Vacuum Cloth Impregnating Equipment—Continued.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.
Shaw, Francis, & Co., Ltd., Manchester, England.

Valve Grinders.
Hydraulic Press Mfg. Co., The, Mount Gilead, Ohio.
Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, Pa.
Quaker City Rubber Co., Philadelphia, Pa.

Valves.
Dunning & Boschert Press Co., Inc., The, Syracuse, N. Y.
Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, Pa.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Utility Manufacturing Co., Cudahy, Wis.
Yarnall-Waring Co., Philadelphia, Pa.

Valves (Reducing).
Mason Regulator Co., Dorchester, Mass.

Varnishing Machines.
Birmingham Iron Foundry, Derby, Conn.

Vulcanizers.
Adamson Machine Co., Akron, O.
Akron Equipment Co., The, Akron, Ohio.
Akron Rubber Mold & Machine Co., Akron, O.
Allen Machine Co., Erie, Pa.
Biggs Boiler Works Co., Akron, O.
Birmingham Iron Foundry, Derby, Conn.
Devine, J. P., Co., Buffalo, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Fisk Rubber Co., Chicopee Falls, Mass.
Miller, Chas. E., Anderson, Ind.
Southwark Fdy. & Mach. Co., Phila, Pa.
Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William R., & Sons' Co., Trenton, N. J.
Williams F. & M. Co., Akron, Ohio.

Washers.
Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Bridge, David, & Co., Castleton, Manchester, Eng.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Shaw, Francis, & Co., Ltd., Manchester, England.
Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William R., & Sons Co., Trenton, N. J.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Washers—Light Steel for Rubber Heels.
Independent Nail & Packing Co., Bridgewater, Mass.
Sessions, J. H., & Son, Bristol, Conn.

Wheels—Wire Buffing.
Cleveland Osborn Mfg. Co., Cleveland, Ohio.

Wrapping Machines.
Adamson Machine Co., Akron, O.
Allen Machine Co., Erie, Pa.
Banner Machine Co., The, Columbiana, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Miller, Chas. E., Anderson, Ind.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Wrapping Machines—Paper.
Pierce Wrapping Machine Co., Chicago, Ill.

Wrapping Machines.
For Wrapping Bundles of Tires, Hose and Wire.
Terkelson Machine Co., Boston, Mass.

SECOND-HAND MACHINERY

Electric Motor & Repair Co., The, Akron, Ohio.
McGrory, Philip, Trenton, N. J.
Norton, M., & Co., Medford, Mass.

RAW MATERIALS AND SUPPLIES

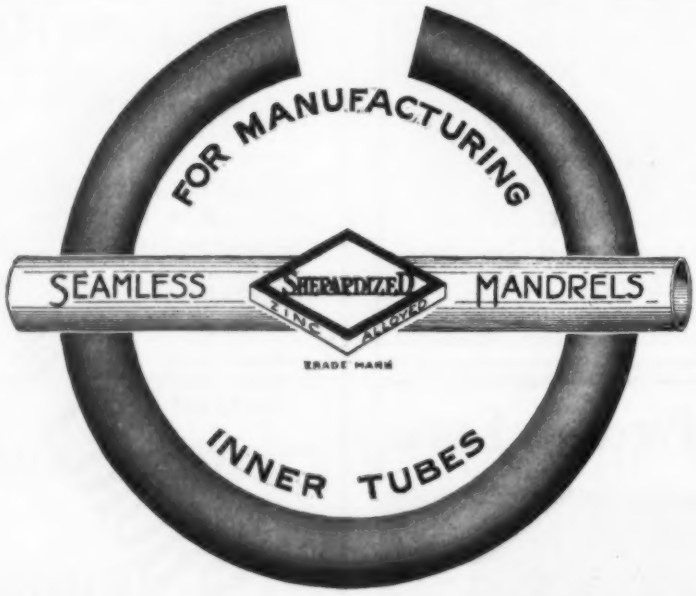
Accelerators.
Daigger, A., & Co., Chicago, Ill.
du Pont, E. I., De Nemours & Co., New York.
Klipstein, A., & Co., New York.
National Aniline & Chemical Co., New York.
Naugatuck Chemical Co., Naugatuck, Conn.
Pfaltz & Bauer, Inc., New York.
Raritan Aniline Works, The, New Brunswick, N. J.
Roessler & Hasslacher Chemical Co., New York.
Smith, Alfred, Ltd., New York.
Tyler Patterson Co., Cleveland, Ohio.
Vul Ko Cene Co., The, Kent, Ohio.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Acids.
Daigger, A., & Co., Chicago, Ill.
du Pont, E. I., De Nemours & Co., New York.
Klipstein, A., & Co., New York.
National Aniline & Chemical Co., New York.
Naugatuck Chemical Co., Naugatuck, Conn.
Pfaltz & Bauer, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

For Complete Addresses See Advertisements—Index Pages 69-71

WE SPECIALIZE in grinding and treating old steel poles. See us before discarding and purchasing new ones.

We supply and insert plugs at a nominal charge.



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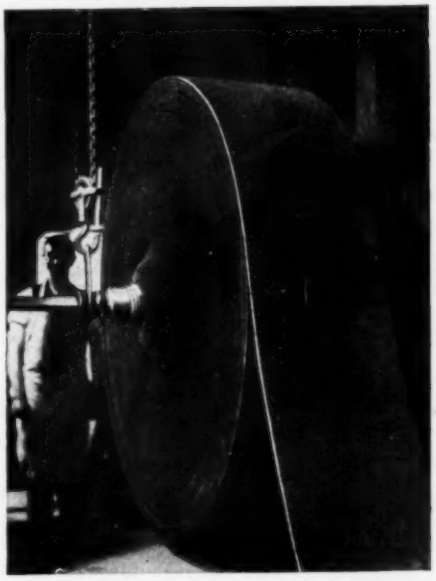
THE NEW HAVEN SHERARDIZING CO.

868 Windsor St., HARTFORD, CONN.

Representatives in Akron, Ohio, Canada, and London, England



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NORTH BRITISH CONVEYOR BELTS

are extensively used in Mines in all parts of the World, and some of the largest belts ever made have been supplied by us.

We are also manufacturers of

ROCK DRILL HOSE

High Pressure, Air, Gas, Suction, Steam and Delivery Hose, Valves, Gaskets, Washers, Gauge Glass Rings, Rubber Boots, North British "Clincher" Pneumatic and Solid Rubber Band Tyres for Cycles, Cars and Heavy Vehicles, etc., etc.

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CASTLE MILLS EDINBURGH

Canadian Warehouse
43 Colborne Street, Toronto, Ontario

B1439

DU PONT ZINC CHROMATE

for Rubber Makers

runs with unvarying uniformity, and therefore can be depended upon in any compound in which it is used.

It is only one of the Du Pont Rubber Makers' Products that help in standardization of processes and factory practice.

Other products are:

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The Standard Lithopone for Rubber Makers

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They are the result of many years of Chemical Research, and are made in factories where large facilities and modern factory methods are reinforced by the immense resources of the Du Pont organization, which was established in 1802.

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CANADIAN SALES AGENCY
PITTSBURGH Fulton Bldg.
SAN FRANCISCO Chronicle Bldg.
Flint Varnish & Color Works of Canada, Ltd. 63 Bay St., Toronto, Ont., Canada.

RAW MATERIALS AND SUPPLIES FOR RUBBER MILLS — Continued

Acids—Sulphuric.

Klipstein, A., & Co., New York.
New Jersey Zinc Co., New York.
Pfaltz & Bauer, Inc., New York.
Scheel, William H., New York.

Alba Whiting.

Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The Cleveland, Ohio.
Industrial Chemical Co., New York.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Aluminum Flake.

Aluminum Flake Co., The, Akron, O.
Scheel, William H., New York.

Aniline Oil.

Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York City.
National Aniline & Chemical Co., New York.
Naugatuck Chemical Co., Naugatuck, Conn.
Pfaltz & Bauer, Inc., New York.
Raritan Aniline Works, The, New Brunswick, N. J.
Scheel, William H., New York.
Tyler Patterson Co., Cleveland, Ohio.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Antimony, Sulphurets of.

Golden and Crimson.

Atlas Chemical Co., Waltham, Mass.
Cooper, Charles, & Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.

Antimony—Sulphurets of—Continued.

Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Hill's, Edward, Son & Co., New York.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
Naugatuck Chemical Co., Naugatuck, Conn.
Pfaltz & Bauer, Inc., New York.
Rare Metal Products Co., Belleville, N. J.
Reichard-Coulston, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Smith, Alfred, Ltd., New York.
Tyler Patterson Co., Cleveland, Ohio.
Typke & King, Ltd., Mitcham, England.
Tyson Bros., Inc., Woodbridge, N. J.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Artificial Rubber.

Ashley, T. C., & Co., Boston, Mass.
Carter Bell Mfg. Co., New York.
Scheel, William H., New York.
Stamford Rubber Supply Co., Stamford, Conn.
Typke & King, London, England.
Tyson Bros., Inc., Woodbridge, N. J.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Asbestine.

Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., The Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Scheel, William H., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Balata.

Aslett & Co., H. A., New York.
Chipman, R. L., New York.
Dunbar, J. Frank, Co., Inc., Boston, Mass.
Jacoby, Ernest, Boston, Mass.
Pell & Dumont, New York.
Sweeney, Snitkin & Sweeney, New York.
Wood, Charles E., New York.

Barium Dust.

Vanderbilt, R. T., Co., New York.

Barium Sulphate Precipitated

Cooper, Charles, & Co., New York.
Klipstein, A., & Co., New York.

Barytes.

Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
Osborn, C. J., Co., New York.
Pfaltz & Bauer, Inc., New York.
Reichard-Coulston, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York, N. Y.
Tyler Patterson Co., Cleveland, Ohio.
Tyson Bros., Inc., Woodbridge, N. J.
Vanderbilt, R. T., Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Basofor.

Waldo, E. M. & F., New York.

Benzol.

Cabot, Samuel, Boston, Mass.
Cooper, Charles, & Co., New York.
Daigger, A., & Co., Chicago, Ill.
du Pont, E. I., De Nemours & Co., New York.

Benzol—Continued.

Klipstein, A., & Co., New York City.
Scheel, William H., New York.
Tyler Patterson Co., Cleveland, Ohio.
Tyson Bros., Inc., Carteret, N. J.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Black Hypo.

Daigger, A., & Co., Chicago, Ill.
Pfaltz & Bauer, Inc., New York.
Reichard-Coulston, Inc., New York.
Scheel, William H., New York.
Typke & King, London, England.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Blanc Fixe.

Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
Reichard-Coulston, Inc., New York.
Tyler Patterson Co., Cleveland, Ohio.
Vanderbilt, R. T., Co., New York.
Waldo, E. M. & F., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Bolted Lime.

Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Pfaltz & Bauer, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Cadmium Yellow.

Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Pfaltz & Bauer, Inc., New York.

For Complete Addresses See Advertisements—Index Pages 69-71

The Efficiency Rubber Gauge
(The Randall and Stickney Thickness Gauge)

With this Gauge the thickness of rubber is determined within .001 inch, and there is no personal factor to be considered.

This instrument has been in use by the leading Rubber Manufacturers of this country and Canada for fifteen years.

Operated by a Standard Pressure on a Standard Area
Send for Descriptive Circular and Prices
FRANK E. RANDALL, Waltham, Mass.

WILLS RUBBER OVERFLOW TRIMMING MACHINE
Trims the overflow from heels, soles, discs, gaskets and other rubber molded goods
Descriptive Circular Sent on Request.
ARTHUR JACKSON WILLS North Brookfield, Mass.

COLONIAL PORCELAIN VITREOUS FORMS

The only porcelain forms manufactured for dipping Rubber Goods which do not craze when passing through either steam or acid cure.
Made by
Colonial Sign and Insulator Co., Akron, Ohio

J. SPENCER TURNER CO.
56 Worth Street New York

FABRICS
OF ALL DESCRIPTIONS
For the Rubber Trade

THE RUBBER PRODUCTS CO.

BARBERTON, OHIO

Stronghold
TIRES & TUBES

HIGH GRADE

Druggists' Sundries Molded Goods

RELIANCE RUBBER CORPORATION

Manufacturers of

Molded Specialties, Plumbers' Rubber Goods, Tubing—Cut Washers and bulbs of all kinds.

Office and Factory, KEYPORT, N. J.

Every Foot Measured Marked Guaranteed

"GLOBE" Automotive Products
"GLOBESTOS" Brake Lining
"GLOBE" Clutch Facings
"GLOBELTS" V & Flat Shape
"GLOBE" Flexible Joints

MADE BY

UNITED & GLOBE RUBBER CO.

TRENTON, N. J.

CARBON BLACKS

We manufacture and sell Carbon Black from Natural Gas

HIGH GRADE PRODUCT

Manufactured by Carbon Black Expert with Twenty Years' Experience

ADDRESS INQUIRIES

OSCAR NELSON

UNION TRUST BUILDING CHARLESTON, W. VA.

RAW MATERIALS AND SUPPLIES FOR RUBBER MILLS — Continued

Cadmium Yellow—Continued.

Roessler & Hasslacher Chemical Co., New York.
Waldo, E. M. & F., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Carbon Bisulphide and Tetrachloride.

Cooper, Charles, & Co., New York.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York City.
National Aniline & Chemical Co., New York.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Tyler Patterson Co., Cleveland, Ohio.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Carbon Black.

Binney & Smith Co., New York.
Cabot, Godfrey L., Boston, Mass.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Industrial Chemical Co., New York.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
Nelson, Oscar, Charleston, W. Va.
Osborn, C. J., Co., New York.
Pfaltz & Bauer, Inc., New York.
Reichard-Coulston, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Stresen-Reuter & Biser, Inc., Chicago, Ill.
Seaver & Co., Boston, Mass.
Tyler Patterson Co., Cleveland, Ohio.
Union Chemical Co., Boston, Mass.
West Co., W. T., Boston, Mass.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Cartons.

Peerless Paper Box Mfg. Co., The, Cleveland, Ohio.

Caustic Soda.

Cooper, Charles, & Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
Scheel, William H., New York.
Tyler Patterson Co., Cleveland, Ohio.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Cement (Rubber).

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Essex Rubber Co., Trenton, N. J.
Goodrich, B. F., Co., The, Akron, O.
Hale, Alfred, Rubber Co., Boston, Mass.
Hodgman Rubber Co., New York.
New York Belting & Packing Co., N. Y.

Cement Cans.

Heifner, J. C., Mfg. Co., Akron, Ohio.

Chemicals and Ingredients.

Ashley, T. C., & Co., Boston, Mass.
Brown, W. G., & Co., Cincinnati, Ohio.
Binney & Smith Co., New York.
Cooper, Charles, & Co., New York.
Daigger, A., & Co., Chicago, Ill.
du Pont, E. I., de Nemours & Co., New York City.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York City.
National Aniline & Chemical Co., New York.
Pfaltz & Bauer, Inc., New York.
Osborn, C. J., Co., New York.

Chemicals & Ingredients—Cont'd

Roessler & Hasslacher Chemical Co., New York.
Smith, Alfred, Ltd., New York.
Stresen-Reuter & Biser, Inc., Chicago, Ill.
Tyler Patterson Co., Cleveland, Ohio.
Tyson Bros., Inc., Woodbridge, N. J.
Waldo, E. M. & F., New York.
Westmoreland Chemical & Color Co., Philadelphia, Pa.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

China Clay.

Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York, N. Y.
Taintor Mfg. Co., H. F., New York.
Vanderbilt, R. T., Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Williams & Co., C, K., Easton, Pa.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Colors.

Binney & Smith Co., New York.
Cooper, Charles, & Co., New York.
Daigger, A., & Co., Chicago, Ill.
du Pont, E. I., de Nemours & Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.

Colors—Continued.

Klipstein, A., & Co., New York City.
National Aniline & Chemical Co., New York.
Osborn, C. J., Co., New York.
Pfaltz & Bauer, Inc., New York.
Reichard-Coulston, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Typke & King, London, England.
Tyson Bros., Inc., Woodbridge, N. J.
Waldo, E. M. & F., New York.
Westmoreland Chem. & Color Co., Philadelphia, Pa.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Cotton Goods.

Ducks and Drills.

Burr, Albert E., Co., New York.
Curran & Barry, New York.
Hewins, E. D., Boston, Mass.
Kavanaugh, Geo. W., New York.
Lane, J. H., & Co., New York.
Meyer, John H., & Co., New York.
Toledo Auto Fabric Co., Toledo, Ohio.
Tower Textile Mills Co., Toledo, Ohio.

Tire Tapes.

Kavanaugh, Geo. W., New York.
Turner, J. Spencer, Co., New York.

Hollands.

Kavanaugh, Geo. W., New York.

Osnaburgs.

Curran & Barry, New York.
Kavanaugh, Geo. W., New York.

For Complete Addresses See Advertisements—Index Pages 69-71

Golden Sulphuret of Antimony

ALL TESTS

MANUFACTURED BY

COOKSON & CO., Ltd. NEWCASTLE-ON-TYNE ENGLAND

ESTABLISHED 1704

FOR SAMPLES AND PRICES APPLY TO

EDWARD HILL'S SON & CO. *U. S. A. Agents* **64 WALL ST., N. Y. C.**

RUBRAX

MANUFACTURERS OF

ELASTIC Hydro-Carbons

Plants and Branches at
BALTIMORE, MARYLAND
CARTERET, NEW JERSEY
PHILADELPHIA, PENNSYLVANIA

RUBRAX QUALITY FIRST THE U.S. ASPHALT REFINING CO.

Eastern Distributing Agent.
EDWARD B. FULPER,
713 American Mechanic Bldg.,
Trenton, N. J.

Western Distributing Agent.
WALTER H. BASS,
Metropolitan Bldg.,
Akron, Ohio

European Agents.
WILLIAM SOMMERVILLE'S SONS RUBBER COMPANY, LTD.
Queen Insurance Bldgs.,
13 Castle Street,
Liverpool, England

THE INTEROCEAN OIL COMPANY
90 West Street, NEW YORK

VALLEY FORGE MAGNESIA CO.

Manufacturers of

Highest Tested Technical Powdered Carbonate Magnesia

ALSO

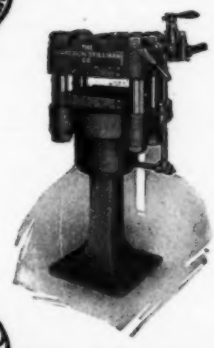
85% Magnesia Steam Pipe Covering and Boiler Lagging in All Mechanical Shapes

Write us for prices and lists.

VALLEY FORGE MAGNESIA CO. **Office and Factory, Port Kennedy, Pa.**

HYDRAULIC PRESSES

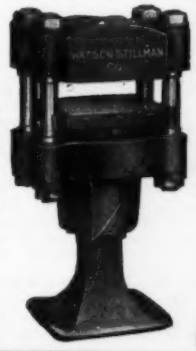
For Heating and Chilling Operations in the Making of Rubber, Gutta Percha and Composition Goods.



We build a large variety of types and sizes of these presses and we show here some examples. They are made in standard sizes from 10 to 1800 tons capacity. *The number of plates and the size of openings can be made to suit conditions.* The top platens can also be made adjustable to accommodate various heights of dies, etc.

We are prepared to furnish complete hydraulic installations, including pumps, accumulators, valves, fittings, etc.

Write for catalogs.



THE WATSON-STILLMAN CO.

CHICAGO, McCormick Bldg. 32 DEY STREET, NEW YORK CITY

381

MANUFACTURING

IRON AND STEEL

MOLDS

FOR RUBBER GOODS

THE DIE SINKING & MACHINE CO.

AKRON, OHIO

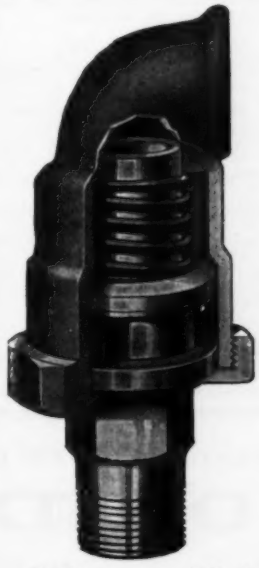
INQUIRIES SOLICITED

L. A. DUFFY, Inc.

Crude Rubber Brokers

15 WILLIAM STREET NEW YORK

Telephone, Broad 5061-5062-5063-5064



TUXEDA SWING JOINTS

Installed on your hot plate presses will increase your production and reduce your steam consumption.

A trial will convince you.

A Guaranteed Solution for Your Flexible Connection Problems

MANUFACTURED BY

FRANKLIN WILLIAMS, Inc.

41 Cortlandt St. NEW YORK

RAW MATERIALS AND SUPPLIES FOR RUBBER MILLS — Continued

Cotton Goods—Continued.

Sheetings.

Kavanaugh, Geo. W., New York.

Stockinettes.

United States Knitting Co., Pawtucket, R. I.

Tire Fabrics.

Bibb Mfg. Co., Macon, Ga.
Brighton Mills, Passaic, N. J.
Burr, Albert E., & Co., New York.
Caldwell, R. J., Co., Inc., New York.
Cabarrus Cotton Mills, Kannapolis, N. C.
Hewins, E. D., Inc., Boston, Mass.
Jenckes Spinning Co., Pawtucket, R. I.
Kavanaugh, Geo. W., New York.
Lane, J. H., & Co., New York.
Manhasset Mfg. Co., Providence, R. I.
Manufacturers' Supply Co., Binghamton, N. Y.
Meyer, John H., & Co., New York.
Salmon Falls Mfg. Co., Boston, Mass.
Taylor, Armitage & Eagles, Inc., New York.
Tower Textile Mills Co., Toledo, Ohio.
Turner, J. Spencer, Co., New York.
Worcester Tire Fabric Co., Worcester, Mass.

Yarns.

Burr, Albert E., Co., New York.
Lane, J. H., & Co., New York.

Crude Rubber—Importers and Exporters.

Astlett, H. A., & Co., New York.
Baird Rubber & Trading Co., New York.
Hankin, Geo., & Co., London, England.
Henderson, F. R., & Co., New York.
Hermans, Marsman & Co., Batavia, Java, D. E. I.
Hirsch, Adolph, & Co., New York.
Johnstone, J. T., & Co., New York.
Mid East Trading Co., Singapore, S. S.
Rubber Importers & Dealers Co., Inc., New York.
Stiles, William H., & Co., New York.
Wilson Co., Charles T., Inc., New York.

Crude Rubber Brokers.

Brown, W. G., & Co., Cincinnati, Ohio.
Chipman, R. L., New York.
Duffy, L. A., Inc., New York.
Dunbar, F. W., & Co., New York.
Dunbar, J. Frank, Co., Inc., Boston, Mass.
Hardy, Roger S., New York.
Jacoby, Ernest, Boston, Mass.
Odell, Jas. E., Boston, Mass.
Pell & Dumont, New York.
Stedman, Arthur W., Inc., New York.
Sweeney, Sniffin & Sweeney, New York.
Wilson Co., Charles T., Inc., New York.

Crude Rubber—Washed and Dried.

Acushnet Process Co., New Bedford, Mass.
Continental Rubber Co., New York.

Fillers.

Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Innis, Speiden & Co., Inc., New York.
Klipstein, A., & Co., New York.
Pfaltz & Bauer, Inc., New York.
Tyler Patterson Co., Cleveland, Ohio.

Fossil Flour—Infusorial Earth.

Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Pfaltz & Bauer, Inc., New York.
Scheel, William H., New York.
Whittaker, Clark & Daniels, Inc., New York.

Gilsonite.

Daigger, A., & Co., Chicago, Ill.
Klipstein, A., & Co., New York.
Scheel, William H., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Graphite.

Daigger, A., & Co., Chicago, Ill.
Innis, Speiden & Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Green Oxide of Chromium.

Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York.
Klipstein, A., & Co., New York.
Reichard-Coulston, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Tyler Patterson Co., Cleveland, Ohio.
Waldo, E. M. & F., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Guayule Rubber.

Continental Rubber Co., New York.
Wilson, Charles T., Co., Inc., New York.

Gutta-Percha.

Astlett, H. A., & Co., New York.
Chipman, R. L., New York.
Dunbar, J. Frank, Co., Inc., Boston Mass.
Hankin, Geo., & Co., London, England.
Jacoby, Ernest, Boston, Mass.
Odell, Jas. E., Boston, Mass.
Pell & Dumont, New York.
Rubber Trading Co., New York—Boston.
Sweeney, Sniffin & Sweeney, New York.
Wood, Charles E., New York.

Halowax Oil.

Condensite Co. of America, Bloomfield, N. J.

Hydro-Carbon Products.

Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Ohlmac Paint & Refining Co., Chicago, Ill.
Robertson, H. H., Co., Pittsburgh, Pa.
Scheel, William H., New York.
Vanderbilt, R. T., Co., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Inner Tube Transfers.

Goshen Printery, Goshen, Ind.

Iron Oxide.

Cooper, Charles, & Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fulper, E. B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Klipstein, A., & Co., New York.
Pfaltz & Bauer, Inc., New York.
Reichard-Coulston, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Smith, Alfred, Ltd., New York.
Tyler Patterson Co., Cleveland, Ohio.
Waldo, E. M. & F., New York.
Westmoreland Chemical & Color Co., Philadelphia, Pa.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Labels—Gummed.

Goshen Printery, Goshen, Ind.

Lampblack.

Binney & Smith Co., New York.
Cabot, Samuel, Boston, Mass.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Osborn, C. J., Co., New York.
Pfaltz & Bauer, Inc., New York.
Tyler Patterson Co., Cleveland, Ohio.
Tyson Bros., Inc., Woodbridge, N. J.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Lead—Blue.

Lead—Sublimed White.

Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Lime Flour.

Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Pfaltz & Bauer, Inc., New York.
Scheel, William H., New York.
Whittaker, Clark & Daniels, Inc., N. Y.

Litharge.

Daigger, A., & Co., Chicago, Ill.
du Pont, E. I., de Nemours & Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York.
Klipstein, A., & Co., New York City.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Lithopone.

Daigger, A., & Co., Chicago, Ill.
du Pont, E. I., de Nemours & Co., New York.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York.
Klipstein, A., & Co., New York City.
New Jersey Zinc Co., New York.
Osborn, C. J., Co., New York.
Pfaltz & Bauer, Inc., New York.
Reichard-Coulston, Inc., New York.
Scheel, William H., New York.
Tyler Patterson Co., Cleveland, Ohio.
Whittaker, Clark & Daniels, Inc., N. Y.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Magnesia.

Daigger, A., & Co., Chicago, Ill.
Ebret Magnesia Mfg. Co., Valley Forge, Pa.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York.
Klipstein, A., & Co., New York.
National Aniline & Chemical Co., New York.
Pfaltz & Bauer, Inc., New York.
Reichard-Coulston, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Smith, Alfred, Ltd., New York.
Stresen-Reuter & Biser, Inc., Chicago, Ill.
Tyler Patterson Co., Cleveland, Ohio.
Valley Forge Magnesia Co., Port Kennedy, Pa.
Whittaker, Clark & Daniels, Inc., N. Y.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Magnesia—Technical.

Valley Forge Magnesia Co., Port Kennedy, Pa.

Magnesite.

Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York.
Klipstein, A., & Co., New York.
Pfaltz & Bauer, Inc., New York.
Tyler Patterson Co., Cleveland, Ohio.
Whittaker, Clark & Daniels, Inc., N. Y.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Magnesium Carbonate.

Klipstein, A., & Co., New York.

Magnesium Oxide, Calcined.

Klipstein, A., & Co., New York.
Roessler & Hasslacher Chemical Co., New York.

Marking and Stencil Ink.

Binney & Smith Co., New York, N. Y.

Mica.

Daigger, A., & Co., Chicago, Ill.
Scheel, William H., New York.
Tyler Patterson Co., Cleveland, Ohio.
Whittaker, Clark & Daniels, Inc., N. Y.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

For Complete Addresses See Advertisements—Index Pages 69-71

We Manufacture a Variety of Shades of

RED OXIDE OF IRON

particularly adapted for
RUBBER MANUFACTURERS' USE

Extremely strong in coloring power and ground impalpably fine. Also various grades of Talc, Soapstone and Asbestine. Write us for samples and prices.

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George W. Kavanaugh, Inc.

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38 N. Second St., Philadelphia

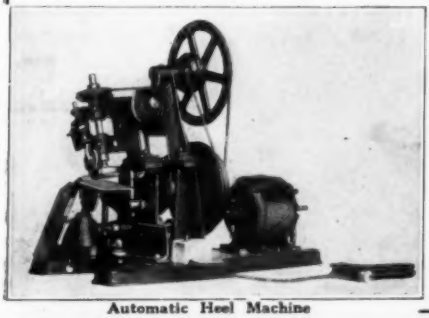
Jacket Sheetings, Hollands

Plain — Tire Tapes — Loop Edge

Enameling Duck, Drills, Sheetings, Osnaburgs

Constructed for the Rubber Trade

The Morris Automatic Trimming Machine



Automatic Heel Machine

For Heels, Soles, Mechanical Goods, Plumbers' Supplies, Strip Rubber, Valves, Gaskets, Packings, Bead Strips, Fountain Syringes, Water Bottles, etc. Everything in molded goods mostly.

Manufactured by

T. W. MORRIS

3304 Warren Ave.

Chicago, Ill.

Send for Catalog.

UTILITY MANUFACTURING CO.

CUDAHY, WIS.

WE SPECIALIZE

in

VALVES and FITTINGS

for Hydraulic Pressures up to 2500 Pounds

AIR HOISTS

SLOTED METALS

MULTIPLE EXPANSION JOINTS

for supplying steam to Movable Plate Presses

AZO ZINC OXIDES

AzoZZZ—Lead Free 99 + % Pure
AzoZZ—Under .5% Leaded
AzoZ—8-10% Leaded

Unequalled purity of AZO ZZZ ZINC OXIDE Produces Superior Quality in Rubber Compounds.

Increases Life

Whitens Stocks

Softens Blacks

American Zinc Sales Company

Distributors of

AMERICAN ZINC, LEAD & SMELTING CO.'S PRODUCTS

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Boston	Columbus	St. Louis	Ft. Worth
Montreal	Chicago	Omaha	San Francisco
Cleveland	Cincinnati	Kansas City	

PLANTS: Hillsboro, Ill., and Columbus, Ohio

PELL & DUMONT, Inc.

CRUDE RUBBER

9 Hanover Street, N. Y.

Telephone: Hanover 636, 637, 638, 639

Akron, Office: Ohio Building

Telephones: Main 1177-5899

MARTIN H. BEHNCKE R. H. FREITAG

The Akron Machine, Mold, Tool & Die Co.

Mechanical Molds, Tools, Dies, Jigs, Fixtures, Templets, Cherrying Vices, Tire Molds, Cores, and general machine work.

NO. 696 BLAINE AVE., AKRON, OHIO

RAW MATERIALS AND SUPPLIES FOR RUBBER MILLS — Continued

Mineral Rubber.

Barber Asphalt Paving Co., Philadelphia, Pa.
Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York.
Inter-Ocean Oil Co., New York.
Lamson, John S., & Bros., Inc., New York.
Ohlmac Paint & Refining Co., Chicago, Ill.
Pioneer Asphalt Co., Lawrenville, Ill.
Rare Metal Products Co., Belleville, N. J.
Robertson, H. H., Co., Pittsburgh, Pa.
Scheel, William H., New York.
Synthetic Products Co., Cleveland, Ohio.
Tyler Patterson Co., Cleveland, Ohio.
Vanderbilt, R. T., Co., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Naphtha.

Daigger, A., & Co., Chicago, Ill.
du Pont, E. I., de Nemours & Co., New York.
Klipstein, A., & Co., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Nitre Cake.

du Pont, E. I., de Nemours & Co., New York.
Klipstein, A., & Co., New York.

Oils — Tar, Pine, Creosote, Rosin, Turpentine.

Daigger, A., & Co., Chicago, Ill.
Fulper, E. B., Trenton, N. J.
Klipstein, A., & Co., New York.
National Rosin Oil & Size Co., New York.
Tyler Patterson Co., Cleveland, Ohio.
West Co., Inc., H. T., Boston.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Oils—Vegetable.

Daigger, A., & Co., Chicago, Ill.
Klipstein, A., & Co., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Paper Boxes.

Peerless Paper Box Mfg. Co., The, Cleveland, Ohio.

Papers for Rubber Makers.

Diamond State Fiber Co., Bridgeport, Pa.

Petrolatum.

Tyler Patterson Co., Cleveland, Ohio.
Vanderbilt, R. T., Co., New York.

Pigments.

Aluminum Flake Co., Akron, Ohio.
Daigger, A., & Co., Chicago, Ill.
du Pont, E. I., de Nemours & Co., New York City.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Industrial Chemical Co., New York.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York City.

Pigments—Continued.

Mineral Point Zinc Co., Chicago, Ill.
New Jersey Zinc Co., The, New York.
Pfaltz & Bauer, Inc., New York.
Reichard-Coulston, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Tyler Patterson Co., Cleveland, Ohio.
Waldo, E. M. & F., New York.
Westmoreland Chemical & Color Co., Philadelphia, Pa.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Pine Tar.

Daigger, A., & Co., Chicago, Ill.
Tyler Patterson Co., Cleveland, Ohio.
Vanderbilt, R. T., Co., New York.
West Co., H. T., Boston, Mass.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Pitch.

Daigger, A., & Co., Chicago, Ill.
Lamson, John S., & Bros., Inc., New York.
National Rosin Oil & Size Co., New York.
Scheel, William H., New York.
Tyler Patterson Co., Cleveland, Ohio.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Precipitated Chalk.

Daigger, A., & Co., Chicago, Ill.
Industrial Chemical Co., New York.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Pumice Stone.

Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Pfaltz & Bauer, Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

"Quaker" Whiting.

Vanderbilt, R. T., Co., New York.
Whittaker, Clark, & Daniels, Inc., New York.

Reclaimed Rubber.

Appleton Rubber Co., Boston, Mass.
Baird Rubber & Trading Co., New York —Boston. (Agent.)
Brown, W. G., & Co., Cincinnati, Ohio.
Clapp, E. H., Rubber Co., Boston, Mass.
Dunbar, J. Frank, Co., Inc., Boston, Mass.
McGrory, Philip, Trenton, N. J. (Agent.)
Monatiquot Rubber Works Co., South Braintree, Mass.
Nearpara Rubber Co., Trenton, N. J.

Reclaimed Rubber — Continued.

New Jersey Rub. Co., Lambertville, N. J.
Odell, Jas. E., Boston, Mass. (Agent.)
Pell & Dumont, New York (Agent).
Pequanoc Rubber Co., Butler, N. J.
Philadelphia Rubber Works, Philadelphia, Pa.
Rubber Regenerating Co., Naugatuck, Conn.
Somerset Rubber Reclaiming Works, New Brunswick, N. J.
U. S. Rubber Reclaiming Co., Inc., N. Y.
Vulcan Recovery Co., Trenton, N. J.

Red Oxide.

Binney & Smith Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Pfaltz & Bauer, Inc., New York.
Osborn, C. J., Co., New York.
Reichard-Coulston, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Tyler Patterson Co., Cleveland, Ohio.
Tyson Bros., Inc., Woodbridge, N. J.
Waldo, E. M. & F., New York.
Westmoreland Chemical & Color Co., Philadelphia, Pa.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Resin.

Daigger, A., & Co., Chicago, Ill.
Scheel, William H., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Rosin.

Daigger, A., & Co., Chicago, Ill.
Tyler Patterson Co., Cleveland, Ohio.
West, H. T., Co., Boston, Mass.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Rotten Stone.

Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Pfaltz & Bauer, Inc., New York.

Rubber Flux.

Synthetic Products Co., Cleveland, Ohio.

Rubber Makers' White.

Daigger, A., & Co., Chicago, Ill.
du Pont, E. I., de Nemours & Co., New York City.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Rubber Substitutes.

Ashley, T. C., & Co., Boston, Mass.
Carter Bell Mfg. Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.

Rubber Substitutes—Continued.

Ideal Roller & Mfg. Co., Brooklyn, N. Y.
Jacoby, Ernest, Boston, Mass.
Scheel, Wm. H., New York.
Smith, Alfred, Ltd., New York.
Stamford Rubber Supply Co., Stamford, Conn.
T. H. & B. Chemical Co., So. Boston, Mass.
Tyler Patterson Co., Cleveland, Ohio.
Typke & King, London, England.
Tyson Bros., Inc., Woodbridge, N. J.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Scrap Rubber.

Bers, E., & Co., Philadelphia, Pa.
Birkenstein & Sons, S., Chicago, Ill.
Chalfin, Joseph, New York.
Cummings & Sons, Wm. H., New York.
Feinberg Co., David, Chelsea, Mass.
McGrory, Philip, Trenton, N. J.
Muehlstein & Co., H., New York.
Norton & Co., M., Medford, Mass.
Schnurmann, J., London, England.
Trenton Scrap Rubber Supply Co., Trenton, N. J.
Weber, Hermann, New York.

Silica.

Daigger, A., & Co., Chicago, Ill.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Soapstone.

Binney & Smith Co., New York.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
National Sales & Trading Co., Cleveland, Ohio.
Pfaltz & Bauer, Inc., New York.
Scheel, William H., New York.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Steam and Hot Water Pipe Insulation.

Ric-wil Co., Cleveland, Ohio.

Sulphur.

Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
Niagara Sprayer Co., Middleport, N. Y.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Southern Acid & Sulphur Co., St. Louis, Missouri.

For Complete Addresses See Advertisements—Index Pages 69-71

For Coloring the Finest Quality of Rubber You Safely Can Use

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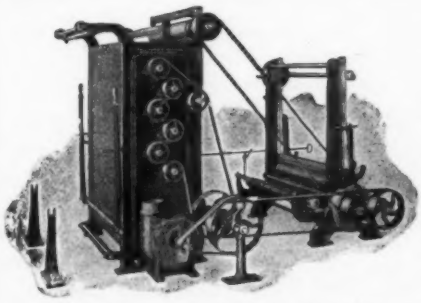

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With Calender Rolling Machine

CURTIS & MARBLE MACHINE CO.

WORCESTER, MASSACHUSETTS

Brushing Machines, for cleaning goods to be coated; for brushing coated goods in connection with starch; or for cleaning cotton liners of soapstone, talc, etc.; Starching Attachments; Mill Sewing Machines, for stitching the ends of pieces together; Measuring Rolls and Dials; Rolling Machines; Inspecting Machines; Guide Frames; Machine Brushes of all kinds, etc.

The building of textile machinery for handling all varieties of cotton and other fabrics is our specialty.

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BOSTON MONTREAL LONDON

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Tire Spreader will quickly and easily spread or open any tire from the smallest automobile tire to the largest truck tire.

Machine is well built and will require no skilled help to operate. Floor space 5 ft. x 5 ft. x 4 ft. high.

After casing or tire is spread, same can easily be inspected or repaired while in this position.

REICHEL & DREWS

Specialists in Tire Renovating Machinery

452-4-6 N. Ashland Ave. CHICAGO, ILLINOIS

RAW MATERIALS AND SUPPLIES FOR RUBBER MILLS — Continued

Sulphur—Continued.

Tyler Patterson Co., Cleveland, Ohio.
White, T. & S. C., Co., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Sulphur Chloride.

Ashley, T. C., & Co., Boston, Mass.
Carter Bell Mfg. Co., New York.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
Pfaltz & Bauer, Inc., New York.
Scheel, William H., New York.
Stamford Rubber Supply Co., Stamford, Conn.
Tyler Patterson Co., Cleveland, Ohio.
Tyson Bros., Inc., Woodbridge, N. J.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Talc.

Binney & Smith Co., New York.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
Pfaltz & Bauer, Inc., New York.
Reichard-Coulston, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Tyler Patterson Co., Cleveland, Ohio.
Vanderbilt, R. T., Co., Inc., New York.
Waldo, E. M. & F., New York.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Tripoli Flour.

Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Pfaltz & Bauer, Inc., New York.
Scheel, William H., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Wax

Daigger, A., & Co., Chicago, Ill.
Dunbar, J. Frank, Co., Inc., Boston, Mass.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
Lamson, John S. & Bros., Inc., New York.
Scheel, William H., New York.
Smith, Alfred, Ltd., New York.
Vanderbilt, R. T., Co., New York.
West, H. T., Co., Boston, Mass.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

White and Blue Lead, Sublimed.

Daigger, A., & Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill

Whiting.

Columbia Products Co., Cleveland, Ohio.
Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Industrial Chemical Co., New York.
Klipstein, A., & Co., New York.

Whiting—Continued.

Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Reichard-Coulston, Inc., New York.
Scheel, William H., New York
Talntor, H. F., Mfg. Co., New York.
Tyler Patterson Co., Cleveland, Ohio.
Tyson Bros., Inc., Woodbridge, N. J.
Vanderbilt, R. T., & Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Wood Flour.

Daigger, A., & Co., Chicago, Ill.
Industrial Chemical Co., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Zinc, Oxide of.

American Zinc Sales Co., New York.
Cooper, Charles, & Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
Mineral Point Zinc Co., Chicago, Ill.
National Aniline & Chemical Co., New York.
New Jersey Zinc Co., New York.
Osborn, C. J., Co., New York.
Pfaltz & Bauer, Inc., New York.
Reichard-Coulston, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Tyler Patterson Co., Cleveland, Ohio.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Zinc Substitute.

du Pont, E. I., de Nemours & Co., New York City.
Scheel, William H., New York.
Tyler Patterson Co., Cleveland, Ohio.

MISCELLANEOUS

Brass Fittings.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Schrader's, A., Son, Inc., New York.

Consulting Rubber Chemists.

Maywald, Dr. F. J., Newark, N. J.
Weber, Dr. Lothar E., Boston, Mass.

Consulting Rubber Engineers.

Dunbar, Wilmer, Greensberg, Pa.

Consulting Rubber Technologist.

Norris, Webster, Brooklyn, N. Y.

Financial.

Halle & Stieglitz, New York.
Skinner, C. R., Philadelphia, Pa.

Patent Attorney.

Boyle, John, Jr., Washington, D. C.

Rubber Plant Engineers

Akron Engineering Co., The, Akron, O.
Consulting Co., Cincinnati, Ohio.
Osborn Engineering Co., The, Cleveland, Ohio.
Rubber Engineering Co., Akron, Ohio.

Submarine Outfits.

Hodgman Rubber Co., New York.
Schrader's, A., Son, Inc., New York.

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NEW YORK BELTING & PACKING CO.
NEW YORK-CHICAGO-BOSTON-PHILADELPHIA-PITTSBURGH-SAN FRANCISCO-ST. LOUIS-
Mechanical Rubber Goods
OUR MODERN PLANT AT PASSAIC, N.J.
NEW YORK BELTING & PACKING CO.
FOUNDED 1846 INCORPORATED 1856
Rubber Belting-Packing-Hose-Moulded Goods

Huetter Metal Air Bag and Building Core

An Important Improvement That Solves a Big Problem in Tire Industry

An Indestructible, Expansible, Metal Steam, Bag and Building Core. Made Collapsible. Is Removed in Sections. Eliminates Present Core and Replaces Fabric Air Bags.

The Huetter Principle of Expansion
STEAM BAG MADE OF SHEET STEEL

Huetter Expansible Steam Cores Have Been Demonstrated in Many of America's Largest Tire Plants

Service Unlimited

Sectional Metal Steam Bag
EVERLASTING

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Shoe Cars and Sticks
Mill-Room Cooling Tables
Stock-Bins, Compound Boxes

Stock Shells, Mold Racks, Lockers, Etc.

THE ORNAMENTAL IRON WORKS CO.
AKRON OHIO

WE CARRY IN STOCK
SEVERAL SIZES OF

RUBBER HEEL WASHERS or BURRS

Our goods are flat, with central holes, of good quality. Furnished in plain steel, coppered or tinned.

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East Street, Bristol, Connecticut, U. S. A.

TRUNK HARDWARE RIVETS STEEL STAMPINGS

P&B P&B

PFALTZ & BAUER
INC.
300 Pearl Street, New York City

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GOLDEN AND CRIMSON
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Arsenic Sulphide YELLOW
Chrome Green
Japan Red
Lead Sulphide BLACK
Guignet Green
Zinc Sulphide WHITE
Lead Sulphate WHITE

Lithopone
R. S. 30
Vermilion
GENUINE

P&B P&B

AKRON-RUBBERMOLD
TIRE BUILDING EQUIPMENT

Complete Tire Factory Equipment

Molds,
Cores,
Building Stands,
Treading Stands,
Tubing Machines,
Steam Tables,
Tire Buffing Machines,
Stripping Stands,
Tube Wrapping Machines,
Steam Splicers,
Core Racks,
Core Cleaners,
Tire Heater Presser,
Impregnating Machines,
Bead Winding Machines,
Rimming Presses.

Tire Factory Equipment That Is Built RIGHT

Tire factory men know they will always get equipment that is right when they place an order with The Akron Rubber Mold & Machine Co. We have specialized in this business for years; we have the facilities for producing molds and cores to best advantage—and, most important of all, you get the benefit of Experience vs. Guess Work. Another thing—our engineering department is always bringing out new ideas and making improvements in detail. Many of the most popular tread designs on the market have originated with us. If you have any problems put them up to Akron Rubbermold Engineering Service.

Write us today for price.

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Manufacturers of Tire Building and Tire Repair Equipment.

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